

Alternative 7; however, it also strictly limits who would be available to acquire these parcels. Qualifying agencies would be those public agencies most hampered by budget restrictions or reductions. This limits the possibility that these parcels will be transferred; however, the designation provides options in the case that a bypass for Highway 97 is developed.

The lands to the east of Redmond would be located outside the Urban Growth Boundary but are consistent with future growth direction, and go into the boundary as it develops. The city is open to cooperative management of these lands. Some uses are likely to occur during the life of the Upper Deschutes RMP.

The land south of the Redmond Airport and the Deschutes County Fairgrounds are in the Urban Reserve Study and would likely be requested for public uses.

Cumulative Impacts

The primary potential for cumulative effects is on land acquisitions. The small pool of lands that would be available for sale or exchange to help acquire private lands is compounded by private demand for some of the same parcels. It is very likely that many if not most of some key parcels would be developed before an exchange or outright purchase could be completed. A prime example of this is the proposed development of a destination resort on the southeast flanks of Powell Butte. This area has been identified as an important area to acquire to link public lands to the east and west of this area for wildlife travel corridors. The small pool of BLM managed lands and the diminishing pool of undeveloped private lands makes the probability of making land tenure adjustments that would meet plan objectives quite low. As with all alternatives, the ability to make land tenure adjustments is dependent not only on the pool of BLM-administered lands available for sale or exchange but also on the availability of undeveloped private lands. The very growth in the region that has spurred this plan revision makes land tenure adjustments needed to meet plan objectives more difficult because of private sector competition for the same parcels.

Overall, in an area with dynamic growth, the exchange process cannot keep pace with the private sector. Simply, it takes too long for a governmental exchange and it is more profitable for private landowners to stay in the private market. It also increases the potential value to not work with BLM, but to use the public parcels as an enticement for private sector land transactions. This further reduces the likelihood of exchanges of public parcels.

Effects of Addressing other Issues on Land Tenure Adjustments

In Common to All Alternatives, Z-2 lands with special status species would not be eligible for exchange. Exchange or sale of lands with rights of way, mineral development or claims, or other encumbrances would be less likely to be exchanged or acquired than other parcels.

Transportation and Utilities

Summary

Each alternative represents a different configuration of lands that are either available for right-of-way project development, excluded from development or available with restrictions. The differences of each alternative reflect a change in magnitude of effect.

Public lands will continue to be available for rights-of-way, including potential sites for wind energy, solar energy, and communication facilities where consistent with national, state and local plans. Alternative energy site testing and monitoring activities would be

considered in areas outside of wilderness study areas (exclusion areas). Areas such as Areas of Critical Environmental Concern (ACECs), visual resource management areas, critical habitat areas, and other special management areas are considered avoidance areas, and would have restrictions to mitigate impacts. Wildlife habitat effectiveness values (primary, secondary, and minor emphases) and recreation management emphases would designate areas for non-motorized emphasis and non-motorized exclusive use. These management designations vary by alternative and will affect the number and location of roads in geographic areas.

During the period the B/LP RMP has been in effect, an average of about twenty-five new rights-of-way per year were granted in the planning area. Currently, there are approximately 742 local utility and transportation right-of-way grants in the planning area, which extend 780 miles through public land. These include right-of-way corridors and communication sites that may contain more than one project. Most rights-of-way were granted to provide access or utility service through public lands and include roads/driveways and electric/telephone service. To date, there has been no interest expressed by industry for solar or wind energy development in the planning area.

In December 2002, ODOT completed the Yew Avenue to Deschutes Market Road Analysis for Highway 97 from MP 121.89 to MP 130.18. The preferred alternative includes an extension of 19th Street south to a proposed interchange at the Hwy. 97/Quarry Street intersection and then approximately another four miles to the south to the existing US 97/Deschutes-Market interchange.

Assumptions

General assumptions

As the population of Central Oregon grows, the need to extend transportation and utility corridors through public land continues. With additional technological improvements, certain areas may be considered for alternative energy development such as wind, solar and biomass generation. While the current contribution of renewable energy resources is relatively small, wind energy and other renewable energy generating sectors of the economy are growing in the United States. Continued growth in wind energy development is considered important in delivering larger supplies of clean, domestic power that is needed for economic growth.

For the most part, existing transportation and utility corridors are situated in areas that will continue to be available in the future for right-of-way project development. There are currently 780 miles of local rights-of-way and utility corridors and 202 miles of regional corridors affecting public land in the planning area. It is likely that many future right-of-way development projects would be co-located along existing corridors. Locating an additional utility line adjacent to an existing right-of-way would allow for the use of the existing access roads and would consolidate impacts. Consolidation produces less contact between competing land uses and conserves resources by confining impacts to specific areas where they can be mitigated and managed.

Federal land management agencies are active participants in the identification of utility corridors. These agencies must comply with laws, policies and regulations that were established to protect resources and create special management areas, which limit the overall area available for corridors. Most utility corridors are designed to extend along existing transportation routes or are parallel to existing right-of-way projects. By consolidating compatible transportation and utility projects, the agency can reduce habitat loss, degradation of resources and fragmentation of public land ownership patterns.

Due to the low potential for wind energy development in the planning area, Visual Resource Management Class II restrictions as well as wildlife and recreation concerns are not expected to have a notable adverse effect on the wind energy industry.

The Concentrating Solar Resource (CSR) in the planning area is higher than the national average. There are many areas available for solar resource development that fall outside of exclusion/avoidance areas. Generally, these locations are equally viable due to the relatively constant CSR. Due to the absence of interest in development of solar resources within the planning area and the large areas that would be available for such development, the designation of exclusion/avoidance areas and other restrictions is not expected to have a notable adverse effect on the solar energy industry.

Corridor widths for transportation and utility facilities would vary depending on the number of parallel systems. A minimum of 1,000 feet on each side of the existing centerline would consolidate multiple regional systems effectively. A system of planned corridors provides programmatic environmental review and facilitates the analysis of project routing alternatives.

The various corridors and avoidance/exclusion area allocations will guide, restrict or preclude energy facilities. Given the uncertainty over specific locations, project design and mitigation measures, project level NEPA will be required to assess impacts. Temporary small-scale facilities, such as wind feasibility monitoring studies will require individual assessments.

Regional transportation assumptions

ODOT predicts that it will be necessary to upgrade the standard of Hwy 126 by adding lanes and reducing the radius of curves. The Redmond Airport Master Plan describes the extension of Runway 22 for a distance of 1,500 feet. This would extend the runway protection zone north and east. The Federal Aviation Administration has mandated the establishment and protection of runway protection zones and would not allow the highway standard to be improved in the existing alignment within the runway protection zone.

Traffic congestion and the anticipated failure of the Yew avenue interchange on Hwy 97 in south Redmond is a result of the high growth rate and increasing traffic volumes caused primarily by activities associated with the Deschutes County Fairgrounds and adjacent commercial and industrial development. The residential development in Redmond is focused in areas that are west of Hwy 97. This contributes to the number of vehicles utilizing the interchange to access commercial, industrial and airport areas located along Hwy 97 and east of this travel corridor. The Bend-Redmond highway corridor contributes significantly to daily traffic numbers at the Yew Avenue interchange. Ultimately, Hwy 97 will require a frontage road to provide access to parcels that are directly adjacent to the expressway.

The Oregon Department of Transportation has been involved in several studies and highway improvement projects in this area in recent years. The project known as the Glacier-Highland Avenue couplet has recently been approved by ODOT and involves the redesign of the intersection of Hwy 126 and Hwy 97. This includes the improvement of Highland Avenue and Glacier Avenue as one way routes for Hwy 126 west of Redmond.

The Redmond Re-route Project is currently being designed by ODOT. It involves the northern segment of Hwy 97 extending east of downtown Redmond along Canal Blvd., from Sisters Avenue to Kingsway Road.

Local transportation assumptions

In Alternatives 2-7, wildlife habitat areas will be managed in terms of primary, secondary, and minor emphases. In general, those areas with “primary” wildlife emphasis are

likely to have fewer local roads that remain open compared to areas with minor wildlife emphasis. Non-motorized categories of recreational use include designations labeled “non-motorized emphasis” and “non-motorized exclusive.” Areas designated as non-motorized emphasis allow motorized use on roads, but not on trails. Non-motorized exclusive areas are closed to all motorized uses. In some cases, areas that have a non-motorized recreation emphasis and a primary wildlife emphasis may see greater reductions of local roads.

The level of management for wildlife and recreation in the geographic areas will influence the allowable road densities for local transportation planning. The level of management will correspond to the prescribed management levels for wildlife (habitat effectiveness) and recreation (non-motorized emphasis and non-motorized exclusive).

The Department of the Interior has imposed a moratorium on the adjudication and formal recognition of roads that are claimed to have been established under the provisions of RS 2477. The county historical roads have not been reviewed and adjudicated by BLM and until such time as these roads are properly adjudicated, BLM will not take any action to challenge their status. Adjudication of historical roads involves a process that is independent of this plan.

Right-of-way corridor assumptions

In Alternatives 2-7, the classification of areas for avoidance, exclusion and areas open for right-of-way project development would serve to minimize conflicts between the needs for land development and the protection of important ecological areas. The number and acres of Areas of Critical Environmental Concern varies by alternative. Table 2-1 represents the acres of ACEC that are designated by alternative. The acreage available for right-of-way development also varies by alternative.

Management direction for rights-of-way in recreation and wildlife emphasis areas will influence the allowable road densities for local transportation planning and right-of-way administration. The level of management for transportation and utility systems will correspond to the prescribed management levels for wildlife (habitat effectiveness) and recreation (non-motorized emphasis and non-motorized exclusive).

The effects of wildlife and recreation emphasis areas on right-of-way projects may include additional project stipulations that require access restrictions, locked gates, and appropriate mitigation. These tasks would require additional analysis in the environmental documents as well as additional compliance efforts in right-of-way administration.

New or modified rights-of-way corridors would be provided for transportation and utility corridors, and for communication or energy sites. New alignments may be considered outside of existing corridors when no existing right-of-way designations are available. Project level NEPA will be required to assess the impacts of large-scale developments, and temporary small-scale facilities, such as wind feasibility monitoring studies will require individual assessments. Western Regional Corridor Study corridors would be designated.

Public lands in the planning area would continue to be available for site testing and monitoring of potential alternative energy projects to determine development feasibility.

The effects of right-of-way development may include surface disturbing activities, erosion, dust, noise, and the need for access projects. Right-of-way allocations may also create conflicts with residents of adjacent lands or onsite conflicts with resources or existing public land uses. Management conflicts such as illegal dumping, shooting near residential areas, vandalism, wood cutting, and surface disturbing activities (which may lead to the spread of noxious weeds), may follow right-of-way project development due

to additional access points to public lands. Wind turbines and powerlines could result in avian mortality including eagles and other raptors, although research efforts in recent years have mitigated these adverse impacts (Sinclair, 1999).

By issuing site and lineal rights-of-way outside of existing corridors, public land ownership patterns could become further fragmented by these new structures and access roads.

Exclusion and avoidance areas would consolidate right-of-way projects in existing corridors that are located in areas designated as available for project development. The consolidation of compatible transportation and utility projects would reduce habitat loss, degradation of resources and the fragmentation of public land ownership patterns. Major transportation and utility corridors border the Badlands Wilderness Study area and would provide for right-of-way co-location around this exclusion area, if needed.

There are visual intrusions introduced on the landscape from the development of right-of-way projects. Road development and surface disturbing activities such as borrow areas and staging areas are effects of constructing major lineal or site right-of-way projects. Soil disturbance and vegetative manipulation are likely to result from construction activities. Utility poles, communication towers, wind turbines, photovoltaic cells, and other structures could have varying adverse effects on viewsheds depending on the location, size, and scale.

The cumulative effect of new right-of-way projects that are not co-located would be greater than the cumulative effects of such projects that are co-located along existing corridors. New right-of-way projects would add to the impacts existing right-of-way projects. The cumulative effects of existing and future projects located on BLM-administered public land are combined with projects located on private, state or other federal ownerships as well.

The designation of exclusion and avoidance areas would cumulatively add to present and future restrictions and mitigation requirements of right-of-way development on public lands. The plan carries forward the restrictions included in the B/LP RMP and adds to the standard terms and conditions required in 43 CFR 2801. Future decisions may add further requirements and/or special stipulations on project development.

Analysis of the Alternatives

Common to Alternatives 2-7

Management direction Common to Alternatives 2 – 7 would emphasize regional and local integrated transportation planning, provide transportation corridor allocations, and provide mechanisms to reduce the amount of redundant or unnecessary roadways. Exclusion and avoidance areas would serve to minimize conflicts between the needs for land development and the protection of important ecological areas. The differences in the transportation systems for each of these alternatives are highly dependent upon future decisions concerning the local road configuration. The two resources most likely to influence these configurations are recreation and wildlife.

The classification of areas for avoidance/exclusion and areas open for right-of-way project development is intended to minimize conflicts between varying needs for land development.

Direct Effects

Regional Transportation

Allocate a transportation corridor for the realignment of Hwy 126 east of Redmond to avoid the designated runway protection zone of Redmond airport.

Local Transportation

Designate all existing right-of-way routes as local corridors for future co-location of compatible projects.

Regional corridors identified by the Western Utility Group as “priority” would be allocated. Existing and proposed regional corridors extend through areas that are available for right-of-way project development and do not affect exclusion and avoidance areas. A system of planned local corridors provides opportunities for programmatic environmental review and facilitates the analysis of project routing alternatives.

Local jurisdictions could be asked to vacate unneeded historical roads as mitigation for granting a right-of-way in a new location. BLM will close and rehabilitate certain non-designated roads and trails that are excess to transportation needs. BLM will reduce the number of general access points to public land. BLM would designate the existing road systems to create loop routes that return to the same access point. Motorized access points not selected for designation, but required for other uses, could be limited to authorized access through such methods as posting, barricading, or installing gates. Examples may include access roads needed by grazing operators and utility companies or local roads needed for administrative access.

Right-of-Way Corridors

Areas are classified as avoidance, exclusion or availability for right-of-way project development. In the existing Brothers-La Pine RMP there are six ACECs that total 24,628 acres. In Alternatives 2-7, the number of ACECs range between eight and twelve, affecting between 23,593 to 60,566 acres.

Regional utility corridors that are designated in the Western Regional Corridor Study, as revised, would be recognized. Proposed routes identified by the Western Utility Group as “priority” would be allocated.

Indirect Effects

Regional Transportation

The effects of project development would result in providing a land allocation for the realignment of the highway when upgrading is determined to be necessary. When Highway 126 is improved, the Federal Aviation Administration will require that it be relocated outside of the runway protection zone. A corridor allocation one half mile wide would extend through public lands to provide a minimum distance and acreage necessary to comply with highway standards and the needs of Redmond Airport and State and local planning goals. The highway would be realigned to allow for increased traffic flows with a higher level of safety for motorists, and the highway right-of-way would be fenced to control access.

Effects of highway realignment would include clearing vegetation along a strip about 100 feet wide that would extend about one mile through public land. Site preparation would involve removal of surface rock and construction of the road base in compacted layers. Sight distances would be improved by removing dips and improving the grade of the road surface. The curve radius would be reduced and overall traffic safety would be enhanced.

Consolidation of regional projects conserves resources by confining impacts to specific areas where they can be mitigated and managed. Federal land management agencies are active participants in the identification of utility corridors. A system of planned corridors provides programmatic environmental review and facilitates the analysis of project routing alternatives. Most utility corridors extend along existing transportation routes or are parallel to existing right-of-way projects.

Local Transportation

Transportation planning would be coordinated with local, state and federal jurisdictions to avoid conflicts with multiple use management. Efficient transportation systems would be designed through cooperative interagency planning. The system would be comprised of designated access points from major collectors or arterials, with approved approaches to major roads from the respective jurisdiction. BLM roads would be identified with markers and designed with loops to provide reasonable access to public lands. Relinquishment of unneeded historical roads would allow BLM to close the road or manage it for purposes other than transportation. Road systems will be considered for closure if problems exist such as resource damage, public safety hazards, and repeated law enforcement violations.

Vacating segments of unneeded historical roads would eliminate surplus routes, and reduce habitat loss and the fragmentation of public land ownership patterns. Closing historical roads to motorized use would serve to protect the cultural value of the road and allow for interpretation and non-motorized access. Closing and rehabilitating certain non-designated roads and trails that are excess to transportation needs would consolidate the local transportation systems, reduce maintenance costs and improve the management capabilities. Reducing the number of access points to public land would consolidate the local transportation system, reduce maintenance costs and improve management capabilities. These reductions may deter illegal uses such as dumping and wood cutting. Existing road systems would be designated to create loop routes that rely on fewer access points. Dead-end roads would be closed and rehabilitated. This would reduce maintenance costs and result in a more efficient transportation system. Certain collector roads, local roads and user created roads may be closed and rehabilitated.

Administrative access may continue to be necessary in areas where routes are closed and access points are reduced. Examples may include utility access roads, grazing access roads, or local roads needed for BLM administrative access. These access points would have gates or cattle guards installed to allow access for authorized uses and to ensure visitor safety. Excess roads that are not designated routes would be closed and rehabilitated to reduce indiscriminate uses such as illegal dumping, wood cutting, and surface disturbing activities that spread noxious weeds and cause erosion.

Signs could be installed at designated access points to convey important information about designated roads and allowable uses in the area. The approach of the access point with a major arterial would be regulated by an approach permit that would be reviewed and approved by the respective jurisdiction. Approach permits would enhance public safety for ingress and egress to public lands from major roads.

Motorized access points not selected for designation, but required for other uses, would be open for authorized users such as grazing operators, utility companies or other administrative uses. This would ensure continued access for authorized uses.

If a new right-of-way is issued contingent upon relinquishment of a public road segment, the County Commissioners would initiate a public process that applies to the vacation of a public road. Rehabilitation could include ripping and seeding road surfaces and covering treated areas with woody vegetative material and rocks to blend with adjacent areas.

Areas would be managed with respect to habitat effectiveness and labeled in terms of primary, secondary, and minor emphasis. For example, a primary emphasis area will be managed for 70 percent habitat effectiveness, which corresponds to a lower road density or acreage configuration of public land ownership. The buffer distances around each site varies by species, and generally would range between $\frac{1}{4}$ and $\frac{1}{2}$ mile.

Right-of-Way Corridors

The indirect effects of exclusion or avoidance areas could possibly result in higher construction costs due to the longer distances for right-of-way projects involved with going around these areas. Also, construction schedules may be delayed for projects that extend through special wildlife habitat areas that may require seasonal access restrictions. Specific effects would be determined on a case-by-case basis.

The indirect effects of wildlife and recreation emphasis areas on right-of-way projects may include additional project stipulations that require access restrictions, locked gates, and appropriate mitigation. This would require additional analysis in environmental documents as well as additional compliance efforts in right-of-way administration.

Specific mitigation activities for a project would serve to reduce long-term impacts to natural resources in areas adjacent to right-of-way development. Restoration of an area would be commensurate with the effects of a specific action. Mitigation requirements would be determined by the environmental assessment report during the processing of a right-of-way application and would correspond to the level of management emphasis and the objectives of the corresponding habitat effectiveness. Mitigation may involve the closing and rehabilitating of surplus roads, the construction/repair/relocation of fences, and efforts to restore native vegetation in the immediate vicinity of the project. The costs of mitigation would be incurred by the applicant.

Mitigation for utility structures may include bird boxes and/or nesting platforms to improve raptor safety. Impacts would be assessed in relation to wildlife emphasis areas and the corresponding management of habitat effectiveness as defined for primary, secondary and minor emphasis areas. The objective of mitigation would be to preserve blocks of public land and to enhance native plant communities and wildlife habitat areas.

If it is not feasible for a new right of way project to collocate along an existing corridor, it will likely create a new impact in an area that is previously undisturbed and would add to the 982 miles of right-of-way that exist in the planning area. Activities would generally be confined to the immediate area affected by the project. Mitigation would provide opportunities to enhance resource values by maintaining habitat diversity.

The effects of right-of-way development may include surface disturbing activities, erosion, dust, noise, the need for access and the spread of noxious weeds. Projects may create conflicts with residents of adjacent lands or onsite conflicts with resources or public land uses.

New right-of-way projects situated outside of existing corridors are subject to the management guidelines for the respective emphasis area. In some cases, these areas coincide. Constraints may be imposed on right-of-way projects to avoid road building and reduce road and trail densities in the immediate vicinity of the project. Right-of-way project development would be designed to avoid impacting large patches of public land that provide un-fragmented habitat areas.

Utility corridors serve to concentrate uses along existing routes and avoid the proliferation of lineal project development to minimize adverse environmental impacts.

By utilizing existing corridors, public land ownership patterns would not be fragmented when new projects are developed. Retaining public land ownership patterns in larger units contributes to efficient management. Utility structures and access routes could be shared by right-of-way holders and access to public lands could be effectively managed.

The co-location of right-of-way projects would consolidate impacts and avoid the proliferation of separate development. Single access routes could be used by multiple users. In addition, regional utility corridors that will allow industry to conceptualize plans for routing regional utility corridors through federal lands could be allocated.

Cumulative Effects

Regional Transportation

The realignment of highway improvements outside of the runway protection zone would benefit the Redmond Airport and improve safety for the general public using the highway. The new route would extend through public lands that are situated adjacent and east of the Redmond urban growth boundary. The improved highway would be established outside of the runway protection zone to connect with other highway improvement projects in the Redmond vicinity. The Federal Aviation Administration requires avoidance of the runway protection zone, by relocating a segment of the Hwy 126 corridor when it is improved, and the new route would be wider and improve motorist safety.

Holders of existing rights-of-way that would be affected by realignment of the highway would be consulted. The relocation of the highway is not expected to have adverse affects on existing rights.

Approved regional corridors will allow industry to plan for regional infrastructure needs and ensure the alignment of corridors with adjacent regions. Specific proposals for projects inside of designated regional corridors will require additional environmental review.

Local Transportation

These proposed actions require coordinated transportation planning with local, state and federal jurisdictions to avoid conflicts with multiple use management. Through cooperative interagency planning with the Oregon Department of Transportation, county road departments, and other agencies, BLM would develop an efficient local transportation system through public lands.

A subsequent transportation planning effort would identify certain collector roads, local roads and user created roads to be closed and rehabilitated. The designation of an efficient, practical road system through public lands may require constructing new road segments to enhance opportunities for administrative and recreational access. A system of roads would include designated access points from major collectors or arterials, with approved approaches from the respective jurisdictions. A designated system that is maintained for public use would enhance travel management and improve public safety.

The transportation system would include the development of grade-separated crossings for recreation trails at specific locations on public lands. Trail crossings would extend under roads to facilitate the connectivity of recreational trails through public lands.

Right-of-Way Corridors

Site-specific analysis of cumulative effects is not possible due to the uncertainty of the

time and location of future right-of-way proposals. However, the cumulative effects of land allocations open to right-of-way uses can be discussed in general terms of areas unavailable for right-of-way designation (avoidance or exclusion areas).

Existing projects include two major buried gas transmission pipelines, a buried gas distribution line, a major irrigation canal, an electric distribution line and a buried telephone cable.

The cumulative effects of off-site mitigations would add to present and future restrictions and mitigation requirements of right-of-way development on public lands. The plan carries forward the restrictions included in the Brothers-La Pine RMP and adds to the standard terms and conditions required in 43 CFR 2801. Future decisions may add further requirements and/or special stipulations on project development.

Alternative 2

In this alternative, an integrated local transportation system would be designed that uses existing road systems. Maintenance standards of BLM-managed roads would be kept to minimum levels and there would be minimal development of new rights-of-way on public lands. Routes may be indirect, alignments narrow and public safety may be at risk. These effects would increase over time as the population and traffic volumes increase.

There would be an allocation for a transportation/utility corridor from south Redmond to Deschutes Junction as a partial solution to resolve traffic problems at the Yew Avenue interchange.

Regional Transportation

The county arterial from south Redmond to the Deschutes Junction Interchange on Highway 97 would alleviate some traffic congestion at the Yew Avenue interchange. This corridor could be considered in the future as part of a highway bypass around Redmond. The transportation/utility corridor from south Redmond to Deschutes Junction would extend ¼ mile on each side of centerline along the Burlington Northern-Santa Fe (BNSF) railroad right-of-way. Mitigation would require Deschutes County to vacate segments of the historic roads known as Horner road and the Powell Butte-Paulina Creek road. These road segments extend about 17 miles through public land in T.16S, R.12-13E.

Local Transportation

Public lands contain numerous historic roads that were presumed to be authorized under the provisions of Revised Statute 2477 and remain under local jurisdiction. In this alternative an integrated transportation system would be designed that utilizes existing and historic road systems including county rights-of way. Maintenance standards of BLM administered roads would be kept at minimum levels to provide for reasonable public access. County standards determine road maintenance levels of county roads. Historic roads are not maintained or improved by county jurisdictions. Maintenance standards of BLM administered roads would be kept at minimum levels to provide for reasonable public access.

Direct Effects

Regional Transportation

Public lands are available for the allocation of a transportation/utility corridor from south Redmond to Deschutes Junction.

Local Transportation

The availability of existing roads to be used as the basis for a designated transportation system. The use of existing alignments would preclude the option of locating new roads along more direct and reasonable routes.

In some cases, areas that have a non-motorized recreation emphasis and a primary wildlife emphasis may see greater reductions in local roads.

*Indirect Effects**Regional Transportation*

A right-of-way corridor from south Redmond to Deschutes Junction would extend about four miles through public land, and equal about forty acres, if it is located adjacent and east of the railroad right-of-way. Anticipated impacts are related to constructing a major public road through an area that currently has limited public access. Adverse impacts to wildlife populations could be expected as well as site-specific impacts associated with locating, clearing and constructing a major public road. Impacts the old growth juniper woodland would include loss of vegetation and soil disturbance. The corridor would also add to the fragmentation of the public land ownership pattern.

If the alignment is placed west of the railroad right-of-way and east of Hwy 97, it would affect mostly private land and only extend through corners of fragmented public ownership. The jurisdiction of these fragmented corners could be transferred to ODOT through provisions of a right-of-way grant, which would reduce the administrative costs to the BLM for managing these isolated areas. An alignment on the west side of the railroad would consolidate the right-of-way between existing corridors.

The construction of a transportation corridor from south Redmond to Deschutes Junction would create a demand for construction materials such as rock aggregate. Specific rock would be needed, as well as borrow material for establishing a suitable grade. Locations on adjacent public lands may be identified as a source for mineral materials.

Local Transportation

Historic roads generally have a narrow alignment, meander around physical features, and have design limitations when compared to the needs of modern transportation systems. Many existing routes were originally located to serve areas that were historically significant, but may not provide efficient or direct access to accommodate the transportation needs of the present time. The use of existing historic roads as the primary component of a transportation system would be insufficient to connect destinations that are needed today. It could be necessary to reduce curves and grades, widen travel lanes, and eliminate physical limitations such as rock outcrops.

The efficiency and function of the transportation system through public lands would be compromised by using existing historic road alignments. The high costs associated with road improvements within existing alignments may not be effective in solving modern transportation problems. Routes may be indirect, alignments may narrow and public safety may be at risk. These negative effects would increase over time as the population and traffic volumes increase.

The following narrative describes the management levels that will influence the allowable road densities for local transportation planning:

- **Non-Motorized Recreation Emphasis Areas** - includes the block of public land southeast of Bend, and south of Highway 20, extending to the Deschutes National Forest boundary; the area around Tumalo reservoir; the area northeast of Sisters; and the area south of Alfalfa Market road extending to Dodds road.

- **Non-Motorized Recreation Exclusive Areas** - includes the area south of Bend Airport; areas along the Deschutes and Crooked Rivers; and public lands adjacent and southeast of Tumalo Reservoir.
- **Wildlife Primary Emphasis Management Areas** - includes the Badlands Wilderness Study Area and the area south of Highway 20 to the National Forest boundary; the area around Tumalo Reservoir; the area northeast of Sisters and areas along the Little Deschutes River, east of La Pine State Park.

Cumulative Effects

Regional Transportation

The cumulative effects of the BLM decision to allocate a transportation corridor from south Redmond to Deschutes Junction would facilitate efforts by regional transportation planners to resolve problems associated with traffic congestion in this area.

Alternative 3

This alternative provides for the allocation of a transportation corridor from south Redmond to with an interchange on Hwy 97. Mitigation would require Deschutes County to vacate 10 miles of historic road segments.

Direct Effects

Regional Transportation

This alternative provides for the allocation of a transportation corridor from 19th Street in south Redmond to Quarry Road with an interchange on Hwy 97. Mitigation would require Deschutes County to vacate a two mile segment of Morrill road and an eight mile segment of the old Powell Butte - Paulina Creek road, located in T.16-17 S., R.13 E.

Indirect Effects

Regional Transportation

The allocation of a transportation corridor from 19th Street in south Redmond to Quarry road with a proposed interchange on Hwy 97 would extend through public lands for about two miles and affect about 19.4 acres.

Anticipated impacts are related to constructing a major public road through an area that currently has limited public access. Adverse impacts to wildlife populations could be expected as well as site-specific impacts associated with locating, clearing and constructing a major public road. Impacts the old growth juniper woodland include loss of vegetation and soil disturbance. The fragmentation of the public land ownership pattern would be increased.

Road construction would create a need for mineral materials such as rock aggregate. Specification rock would be needed as well as borrow material for establishing a suitable grade. Sites on adjacent public lands may be identified as a source for mineral materials.

Local Transportation

The following narratives describe the management levels that will influence the allowable road densities for local transportation planning:

- **Non-Motorized Recreation Emphasis Areas** - includes the block of public land southeast of Bend and south of Highway 20, extending to the Deschutes National Forest boundary; the area northeast of Sisters; and the area southeast of Prineville Reservoir.
- **Non-Motorized Recreation Exclusive Areas** - include the Badlands Wilderness Study Area, the area south of Alfalfa Market Road to Dodds Road, Cline Buttes east to the Deschutes River; a large block along the Crooked River canyon between Prineville and Bowman Dam; and public lands surrounding Tumalo Reservoir.

- **Wildlife Primary Emphasis Management Areas** - includes the area around the Crooked River Canyon, Prineville Reservoir and south to Millican; the Badlands Wilderness Study Area and the area south of Highway 20 to the National Forest boundary; the area around Tumalo Reservoir, the area northeast of Sisters; Cline Buttes east to the Deschutes River; and the area south of Alfalfa Market Road to Dodds Road, most of the public lands in the La Pine basin, except those east of the La Pine core area.

Cumulative Effects

Regional Transportation

A transportation/utility corridor from south Redmond to Quarry Road would provide a beneficial effect as a component in solving traffic flow problems in the south Redmond area.

This allocation considers the transportation needs of a growing community. This alternative would accommodate the additional traffic associated with the projected growth in the region and the development of commercial and industrial lands in the south Redmond area. The cumulative effects of the BLM decision to allocate a transportation corridor from south Redmond to Deschutes Junction would facilitate efforts by regional transportation planners to resolve problems associated with traffic congestion in this area.

Alternative 4

Indirect Effects

Local Transportation

In some cases, areas that have a non-motorized recreation emphasis and a primary wildlife emphasis may see a greater reduction of local roads.

The following narrative describes the management levels that will influence the allowable road densities for local transportation planning:

- **Non-Motorized Recreation Emphasis Areas** – south of the Crooked River and the area southeast of Prineville Reservoir; the block of public land southeast of Bend and south of Highway 20, extending to the Deschutes National Forest boundary; south of Alfalfa Market Road to Dodds Road; the Tumalo Reservoir area; the area east of Cline Buttes to the Deschutes River.
- **Non-Motorized Recreation Exclusive Areas** - includes the corridor along the Deschutes and Crooked River canyon; the public lands on Powell Buttes; the small block of public land south of Bend Airport and east of the Powell Butte highway.
- **Wildlife Primary Emphasis Management Areas** - includes the area around the Crooked River Canyon, and the area southeast of Prineville Reservoir; the area around Tumalo Reservoir, the area northeast of Sisters; the public lands along the east – west corridor extending through La Pine State Park.

Alternative 5

Indirect Effects

Local Transportation

In some cases, areas that have a non-motorized recreation emphasis and a primary wildlife emphasis may see a greater reduction of local roads.

The following narrative describes the management levels that will influence the allowable road densities for local transportation planning:

- **Non-Motorized Recreation Emphasis Areas** – the area northeast of Sisters; the area around Tumalo Reservoir; the area adjacent to Cline Buttes; the area between the Powell Butte Highway and Dodds Road; the area southeast of Bend and north of Golden Basin; and the area southeast of Prineville Reservoir;
- **Non-Motorized Recreation Exclusive Areas** - the area southeast of Bend and south of Golden Basin; the public lands on Powell Buttes; a large block along the Crooked River canyon between Prineville and Bowman Dam; the public lands between the Cline Buttes Highway and the Deschutes River; the Steamboat Rock area, the Smith Rocks area; and areas along the Crooked and Deschutes River.
- **Wildlife Primary Emphasis Management Areas** - includes the Badlands WSA, south to the National Forest boundary; a large block along the Crooked River canyon between Prineville and Bowman Dam; the area around Tumalo Reservoir; the area northeast of Sisters; the Steamboat Rock area, the Smith rock area; the public lands along the east – west corridor extending through La Pine State Park.

Alternative 6

Indirect Effects

Local Transportation

In some cases, areas that have a non-motorized recreation emphasis and a primary wildlife emphasis may see a greater reduction of local roads.

The following narrative describes the management levels that will influence the allowable road densities for local transportation planning:

- **Non-Motorized Recreation Emphasis Areas** – the area southeast of Bend and north of Golden Basin; the area south of Alfalfa Market Road to Dodds Road; the area southeast of Prineville Reservoir; the area northeast of Sisters; the Steamboat Rock area; the area east of Redmond and north of Hwy 126; the public lands within the east – west corridor extending through La Pine State Park.
- **Non-Motorized Recreation Exclusive Areas** – includes the Badlands WSA, north Millican area, and the Horse Ridge area south of Golden Basin; the public lands on Powell Buttes; a large block along the Crooked River canyon between Prineville and Bowman Dam; the area around Tumalo Reservoir; the Smith Rock area; areas along the Crooked and Deschutes River; and many scattered, isolated parcels through out the planning area.
- **Wildlife Primary Emphasis Management Areas** - includes the Badlands WSA, south to the National Forest boundary; east to the North Millican area and southeast of Prineville Reservoir; a large block along the Crooked River canyon between Prineville and Bowman Dam; the area around Tumalo Reservoir; the area northeast of Sisters; the Smith Rocks area; and most of the public lands in the La Pine basin, except those east of the La Pine core area.

Alternative 7

Indirect Effects

Local Transportation

In some cases, areas that have a non-motorized recreation emphasis and a primary wildlife emphasis may see a greater reduction of local roads.

The following narrative describes the management levels that will influence the allowable road densities for local transportation planning:

- **Non-Motorized Recreation Emphasis Areas** – the area southeast of Bend and north of Golden Basin; the area from the Alfalfa Market Road north to the Powell Butte Highway; the area northeast of Sisters; the area southeast of Prineville Reservoir extending south to Hwy 20 adjacent and west of Hwy 27; the northern portion of the La Pine basin.
- **Non-Motorized Recreation Exclusive Areas** – includes the Badlands WSA; the Horse Ridge area south of Golden Basin; the area south of Alfalfa Market Road to Dodds Road; a large block along the Crooked River canyon between Prineville and Bowman Dam; the area around Tumalo Reservoir; the area east of the Cline Falls Highway to the Deschutes River; the Smith Rocks area; areas along the Crooked and Deschutes River; the area east of Redmond, north of Hwy 126 and west of the North Unit Main Canal; and many scattered, isolated parcels through out the planning area. .
- **Wildlife Primary Emphasis Management Areas** - includes the area from Alfalfa Market Road south, with the Badlands WSA, to the National Forest boundary; east to the North Millican area and southeast of Prineville Reservoir; a large block along the Crooked River canyon between Prineville and Bowman Dam; the area around Tumalo Reservoir; the area northeast of Sisters; the Smith Rocks area; the area east of the Cline Falls Highway to the Deschutes River; and most of the public lands in the La Pine basin, except those east of the La Pine core area.

Alternatives 4 – 7

Regional transportation

These alternatives provide for the allocation of a transportation corridor that would extend from south Redmond to the interchange at Deschutes Junction on Hwy 97 with an interchange at Quarry road. Mitigation would require Deschutes County to vacate 19 miles of historic road segments. ODOT analysis indicates that this alternative would improve current and projected traffic problems associated with the Yew avenue interchange. This is a component to the preferred alternative in the ODOT study, Yew Avenue to Deschutes Market Road Analysis for Highway 97 from MP 121.89 to MP 130.18.

Allocation of the corridor that would allow for an arterial from south Redmond to an interchange at Quarry road and Highway 97, plus the extension of an arterial south to the interchange at Deschutes Junction and Highway 97. There would be no access from the arterial to the adjacent public lands.

Direct Effects

Regional Transportation

The south Redmond to Deschutes Junction corridor would be (1/4) mile wide on each side of the centerline of the Burlington Northern-Santa Fe (BNSF) railroad right-of-way.

In Alternatives 4-7, both corridor allocations are proposed with mitigation that would require Deschutes County to vacate segments of the following historic roads located in T.16-17 S., R.13 E.:

Horner Road - 9 miles
Powell Butte - Paulina Creek Road, 8 miles
Morrill Road - 2 miles

Indirect Effects

Regional Transportation

This alternative would have similar indirect effects as the allocation of a transportation/utility corridor from South Redmond to Deschutes Junction, as described in Alternatives 2 and 3 above.

Cumulative Effects

Regional Transportation

This alternative would have similar cumulative effects as the allocation of a transportation/utility corridor from South Redmond to Deschutes Junction, as described in Alternatives 2 and 3 above.

ODOT's analysis indicates that this alternative would improve current and projected traffic problems. The preferred alternative in the Yew Avenue to Deschutes Market Road Analysis for Highway 97 from MP 121.89 to MP 130.18 includes an extension of 19th Street south to a proposed interchange at the US 97/Quarry Road intersection and then approximately another four miles to the south to the interchange at Deschutes Junction.

Public Health and Safety

Summary

The public health and safety discussion in this RMP is limited to firearm discharge (both target shooting and hunting), dumping, campfires, and authorities provided to BLM law enforcement rangers. To improve document readability and increase understanding of the issues, these four topics are discussed in the public health and safety section in their entirety (e.g. recreation management related to firearm discharge, dumping, and campfires are also discussed in this section). In addition, other sections address public health and safety concerns, e.g. the fuels section discusses the dangers of wildland fire related to lightning.

The effects of firearm discharge management are important in regard to public health and safety, vegetation and wildlife concerns, and recreation. Rapidly increasing human populations will further accentuate the need to examine the effects of firearm discharge management.

The direct and indirect effects of each alternative in regard to firearm discharge will primarily result in closures to all firearm discharge, or to firearm discharge unless legally hunting. Since the alternatives vary primarily by the number of acres in each of the two types of closures, the types of effects are generally the same for each alternative, although a few site-specific notes have been made.

Assumptions

Definitions

Hunting is defined as an attempt to take wildlife during a designated season, with a valid license.

Table 4 -25: Summary of acres (and percent of acres) closed to all firearm discharge (FD), and closed to firearm discharge unless legally hunting.

	Common to All Alts.	Alt. 1	Common to Alts. 2-7	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Closed to all FD	590 (<1%)	710 (<1%)	4,779 (1%)	4,779 (1%)	8,418 (2%)	8,418 (2%)	8,418 (2%)	6,411 (2%)	10,500 (3%)
Closed to FD unless legally hunting	527 (<1%)	3,646 (1%)	14,551 (4%)	19,684 (5%)	120,333 (30%)	22,236 (6%)	109,010 (27%)	57,674 (14%)	82,631 (20%)

Note: Alternative 1 and CT Alt 2-7 figures include closures in CTA. Alternative 2, 3, 4, 5, 6, and 7 figures include closures in CTA and CT Alt 2-7. Figures for areas closed to all firearm discharge include 290 acres of seasonal raptor closures.

Closure to firearm discharge would not apply to a person conducting the official business of BLM personnel or their designee, including but not limited to a person acting in defense or protection of an individual, dispatching a critically injured animal for humane purposes, or dispatching a dangerous or damage-causing animal. The closure would also not apply to discharge of projectiles with a limited range where the projectile is likely to hit the ground before hitting unintended targets, including but not limited to bows or compound bows, slingshots, BB guns, or paintball guns. Closures would also not apply to discharge of weapons utilizing “blank” ammunition where no projectile is discharged, including but not limited to blanks for dog training purposes, or blanks used by the Military for official training purposes.

Closed to firearm discharge unless legally hunting will not prohibit year-round hunting of “unprotected mammals and birds”.

Visitors are defined as members of the public on BLM-administered public land in the planning area.

Assumptions about the recreational experience, and about conflicts with other uses and adjacent landowners

Many firearm discharging visitors enjoy returning to the identical site time after time.

While many visitors engaging in firearm discharge ensure they shoot in a safe manner and clean up their trash, some of these visitors are not safety conscious, damage natural and cultural resources, and do not remove their trash. Additionally, within the population of visitors discharging firearms on BLM-administered land, hunters are assumed to leave behind a relatively small amount of the firearm discharge-related trash observed within the planning area.

The rapid increase of human populations in Central Oregon is expected to exacerbate conflicts between those who enjoy and support discharging firearms on BLM land, and those who do not.

Perceptions of safety and solitude are more likely when firearm discharge is predictable (occurs at specific locations and/or primarily during fall big-game hunting seasons).

Areas closed to all firearm discharge will most benefit those visitors uncomfortable with firearm discharge, especially in respect to perceived personal safety.

Overall effects of closures to all firearm discharge on availability of recreational opportunities will be minimal because these closures are limited, and opportunities for firearm discharge will continue to exist nearby.

Areas closed to firearm discharge unless legally hunting will allow year-round hunting ("unprotected mammals and birds"), reducing perceptions of safety and natural quiet.

Areas without firearm discharge restrictions will provide the greatest opportunities for target shooting and hunting recreationists.

Firearm discharge closures in areas of moderate recreational use, with limited inholdings or adjacent landowners, will have greater positive effects on solitude than closures of similar acreage with intense recreational use, with numerous inholdings or adjacent landowners.

Firearm discharge closures in urban areas (areas with intense recreational use, and numerous access points and adjacent landowners) were evaluated as having greater positive effects on the availability of recreation than closures in areas of similar acreage with more rural characteristics (moderate recreational use, few access points, and adjacent landowners)

Visitors displaced by closures of BLM-administered land to firearm discharge will continue to engage in firearm discharge activities in other adjacent areas where firearm discharge is legal, as opposed to participating in a different activity within the firearm discharge closure area.

Firearm discharge closures in areas with intense recreational use and/or a relatively rare recreational experience will increase the availability of diverse recreation opportunities more than closures of similar acreage in areas of moderate recreational use and/or a common recreational experience. For example, a firearm discharge closure in the Badlands would have greater positive impacts to the diversity of recreation because Wilderness Study Areas are rare in the planning area, as opposed to a closure of similar acreage in the Bend-Redmond block, where recreational substitutes are relatively common.

Firearm discharge closures in areas with intense recreational use and numerous privately owned inholdings and adjacent landowners would increase the compatibility of recreation than closures of similar acreage in areas of moderate recreational use and moderate amounts of inholdings and adjacent landowners.

Except for hunting, most firearm discharge is a vehicle-dependant activity because most participants want their vehicles immediately adjacent to their shooting area for easy access to supplies. This means areas closed to all motorized travel and closed to firearm discharge unless legally hunting will have limited additional effect on the availability of recreational opportunities above the effects associated with the motorized closure alone.

Assumptions about management, including implementation

All visitors, including visitors engaging in firearm discharge, prefer the BLM to utilize the least amount of management control possible and still achieve the conditions for which the area is managed.

ODF&W uses recreational hunting as a tool to monitor and control game species; this tool would not be used in areas closed to all firearm discharge. Areas closed to firearm discharge unless legally hunting will have a minimal effect on wildlife.

Firearm discharge is generally easier to manage in rural areas than in urban areas because urban areas generally include an increased density of recreationists, increased diversity of recreational uses, increased diversity of land uses, and increased number of adjacent landowners (especially adjacent residential landowners).

Providing a diversity of recreation opportunities is dependent upon the BLM and its partners providing facilities, services, and active resource and social management. Without active recreation management including specially-designated use areas, designated trails, and public information on road and trail systems, the resulting recreation setting will offer a high degree of freedom of choice, but will also result in limited opportunities for many types of recreation. There is good evidence to show this is already happening in some places within the planning area.

Areas closed to firearm discharge unless legally hunting will be more difficult to enforce than closures to all firearm discharge, since it may not be clear that someone is violating a closure unless he/she is contacted personally.

Areas closed to firearm discharge unless legally hunting may be more confusing to visitors, placing additional pressure on BLM's limited law enforcement staff. In addition, alternatives that close more acreage to firearm discharge, campfires, and dumping will be less understandable and enforceable than alternatives with fewer closures.

Implementation of firearm discharge closures will require an understanding of access points, posting of signs, and working with volunteer / Adopt-an-Open-Space groups for information distribution and feedback.

In general, alternatives closing the most acreage to firearm discharge, campfires, and dumping will be less implementable than alternatives with fewer restrictions. Implementability refers to the potential difficulty of the Prineville BLM office to successfully implement direction provided in this section.

Closures delineated by easily identifiable boundaries (e.g. natural features, roads) will be more understandable, enforceable, and implementable because both the public and BLM staff will more readily understand which restrictions apply to which geographic areas. This closure identifiability should not vary by alternative, except in relation to the total acreage closure of the alternative.

Assumptions about impacts to natural resources

Vegetation:

- Trees and other vegetation will experience a limited number of firearm discharge related injuries and loss in areas open to all firearm discharge, especially by those who are not hunting.
- Areas closed to all firearm discharge will provide the greatest protection to vegetation. Areas closed to all firearm discharge unless legally hunting will provide a limited amount of protection.

Wildlife:

- In areas closed to all firearm discharge, hunting will no longer be available to control wildlife populations, especially game species, and the recreational aspects of hunting will be lost.
- Areas closed to firearm discharge unless legally hunting will have a minimal effect on wildlife.

Distinct Natural Land Forms:

- Firearm discharge closures in areas of topographical relief, with intense recreational use and numerous adjacent landowners were evaluated as having greater positive effects on distinct natural land forms than closures of similar acreage without topographical relief, and /or moderate recreational use and limited adjacent landowners.

Assumptions about cumulative effects analysis area

The Public Health and Safety cumulative effects analysis area includes the entire UDRMP planning area, and a limited amount of additional USFS acreage. Within the planning area, other public land parcels will be included in the cumulative effects analysis, including lands managed by Oregon State, Bend Metro Parks and Recreation District, the Central Oregon Parks District, and the Bureau of Reclamation. Additional areas outside of the UDRMP boundary include the Deschutes National Forest close to Sisters and Bend, and parts of the Crooked River National Grasslands near Crooked River Ranch. These non-BLM areas are included in the cumulative effects analysis because they are within the Central Oregon urban interface area, are subject to similar urban types of pressures, and are readily accessible by the same visitors recreating on BLM lands within the planning area.

Incomplete or Unavailable Information

Very little data was available for the following Public Health and Safety effects analysis, limiting the extent and scope of the effects analysis, and making it difficult to know how best to manage firearm discharge to limit conflicts.

Although popular target shooting sites in the planning area are known, the total number of target shooting sites and the total number of target shooters is unknown.

Only minimal information is available concerning the demographics and preferences of target shooters and hunters in Central Oregon. This limits inferences about how visitors presently engaging in firearm discharge would react if their traditional use areas are closed. These visitors might: visit a nearby managed shooting range, drive additional miles to engage in the same activities on nearby public lands, or forgo the opportunity to discharge firearms.

Only minimal information is available about the concerns and preferences of non-firearm discharging recreationists in Central Oregon.

It is important to note that the following comparison of the alternatives with respect to firearm discharge does not necessarily reflect a comparison of how much firearm discharge will occur. There is no known direct correlation between the number of acres available for firearm discharge, and the amount of firearm discharge that would occur. Because of these limitations it is impossible to quantify the firearm discharge impacts of each alternative because the number of current and future firearm dischargers and firearm discharge sites is unknown.

The discussion of the effects of dumping solid and hazardous waste is similarly difficult to that of firearm discharge. While the Public Health and Safety Issue Team observed that dumping activities seem to be connected with full-sized vehicle access, there is no known direct correlation between the amount of solid and hazardous waste left on BLM lands, and the number of acres available for full-sized vehicle access. While generalities can be made, dumping within the planning area is widespread and highly changeable. Although the Public Health and Safety alternative discussion has noted historical, problematic dumping areas, site-specific closures to user-created travelways have not been established. However, in the Recreation alternative section, as a means to provide

a diversity of recreation settings, specific areas have been identified as being managed for exclusive non-motorized use (see the Recreation Alternative Summary Table, Table 4-22). These areas would be closed to all motor vehicles, presumably providing a de-facto closure to dumping. The difficulty lies in the process of quantifying the effects of dumping related to these non-motorized closures. Some areas slated for motor vehicle closures to provide recreation setting goals are highly impacted by dumping, while other areas experience extremely little or no dumping. Because of these limitations it is impossible to quantify the dumping impacts of each alternative because the amount of dumping per acre is variable, and unknown.

Finally, both the Access and Transportation, and Recreation sections include additional direction relevant to the dumping of solid and hazardous wastes. That language includes the designation of a road and trail system, with reduced numbers of access points, and reduced numbers of redundant, user-created travelways. While site-specific closures and designation of a particular trail system are beyond the scope of this Plan, the combination of the above actions is expected to reduce dumping within the planning area. This is because (1) there will be fewer access points for dumpers to legally access BLM land, and (2) concentrating use on the remaining approved roads and trails is expected to result in an actual increase, or perceived increase in the number dumpers being identified and cited for dumping. While the effects are impossible to quantify, it is reasonable to assume that generally an increase in the amount of BLM land closed to full-sized vehicle access should result in a reduced amount of solid and hazardous waste dumped on BLM Prineville land.

Analysis of Alternatives

Common to All Alternatives

Firearm Discharge

Firearm discharge closures Common to All Alternatives are a continuation of management direction provided in Federal Register closures established after the completion of the Brothers/La Pine RMP.

The direct effect of these four firearm discharge closures is to prohibit all firearm discharge on 590 acres, and firearm discharge unless legally hunting on 527 acres. This management direction provides limited protection for natural and cultural resources, few opportunities for land users to experience natural quiet and increased perceived safety (therefore, little diversity of recreation opportunities), and limited compatibility in recreation emphasis.

Indirectly these Common to All Alternative firearm discharge closures would be expected to displace a small amount of firearm discharge, but the extent of this displacement is unknown.

Alternative 1

Firearm Discharge

Alternative 1 would include two closures in addition to the four closures that are common to all alternatives. The direct effect of these six firearm discharge closures in Alternative 1 is to prohibit opportunities for all firearm discharge on 710 acres, and firearm discharge unless legally hunting on 3,646 acres. These closures provide less resource and cultural protection, fewer opportunities for land users to experience natural quiet and increased perceived safety, less diversity of recreation opportunities, and less recreation compatibility than any other alternative. Alternative 1 has the least acres closed to firearm discharge, and would therefore be expected to be the most understandable, enforceable, and implementable of all the alternatives.

Indirectly, these Alternative 1 firearm discharge closures are expected to displace less firearm discharge to other geographic areas than all other alternatives, but the extent of those displacements is unknown. Cumulatively these closures to firearm discharge on BLM-administered land, along with similar closures implemented by other land management agencies within the cumulative effects analysis area, would be expected to provide more regional opportunities to discharge firearms than any alternative. Alternative 1 is expected to produce more conflicts among recreational users and between recreational users and adjacent landowners than any other alternative.

Campfires

Alternative 1 includes an existing Federal Register notice that closed 3,119 acres of the Lower Crooked and Middle Deschutes Wild and Scenic Rivers (WSR) to campfires between June 1 and October 15. This Alternative provides the greatest opportunities for campfires of any alternative, but also the least amount of wildfire protection related to campfires. Crooked River Ranch (CRR), a subdivision situated on a peninsula of land between the Lower Crooked and Middle Deschutes rivers, normally closes its boundaries to campfires between June 1 and November 1. This means CRR and the WSR corridors are closed to campfires, but the intermixed BLM uplands areas are open to campfires, which is confusing to the public and difficult to enforce.

Dumping

The alternatives do not include any specific actions related to dumping in Alternative 1; however, closures to motorized vehicles described in the Recreation section are expected to have indirect effects on dumping. In Alternative 1 11,111 acres, or about 3 percent of the planning area would be managed for exclusive non-motorized use, effectively closing these areas to motorized vehicles, resulting in a probable reduction in the amount of waste dumped within the planning area. Although a quantitative analysis is not possible, it is reasonable to assume Alternative 1 would contribute to more dumping than any other alternative. Compared to the other alternatives, these limited closures provide the least amount of natural resource protection, and the least opportunity for visitors to experience an aesthetic natural landscape. Alternative 1 is expected to require the least amount of engineering and design, but the greatest amount of ranger presence and enforcement.

Common to Alternatives 2-7

Actions Common to All Alternatives include:

- Closure of some small, isolated blocks to all firearm discharge in areas of threatened natural or cultural resources, high visitation, and user conflicts;
- Closure of ACECs, RNAs, WSRs, and other special areas to firearm discharge unless legally hunting; and
- Closure of ACECs, RNAs, and other highly developed sites to campfires year-round, and closes the Middle Deschutes and Lower Crooked Wild and Scenic River corridors and adjacent uplands to campfires.

Firearm Discharge

All action alternatives would result in closing 4,779 acres of BLM land to all firearm discharge, and 14,551 acres to firearm discharge unless legally hunting. Compared with current management, these closures would provide additional but limited natural resource and cultural protection, additional but limited opportunities for land users to experience natural quiet and increased perceived safety, additional but limited diversity of recreation opportunities, and additional but limited recreation compatibility.

Indirectly these Common to Alternative 2-7 firearm discharge closures would be expected to displace more firearm discharge activity to other geographic areas than would Alternative 1. Because the closures common to all action alternatives generally focus on small, isolated parcels adjacent to residential areas with high rates of recreational use, most of the displaced firearm discharge use is expected to move to larger blocks of

BLM land, in areas with relatively fewer recreationists and adjacent residents. While the location and extent of these displacements is unknown, it is reasonable to assume some firearm dischargers will move to nearby BLM lands, including the Cline Buttes and Bend-Redmond blocks. Cumulatively these BLM closures to firearm discharge, along with similar closures implemented by other land management agencies within the cumulative effects analysis area, will have a greater reduction on the regional opportunities to discharge firearms than Alternative 1. Under this approach the predicted increase in human populations, residential development, and recreational use of natural areas in Central Oregon is expected to result in greater firearm discharge related conflicts among recreational users, and between recreational users and adjacent landowners than Alternative 1.

There are cumulative effects related to the guidelines described in the Reducing Risk in Residential Areas section (in Chapter 2). That section describes a mechanism whereby residents living in subdivisions adjacent to BLM-administered land may close their subdivision to all firearm discharge, and then request the appropriate local government to lawfully establish those closures under formal land use processes. With legal closures in place, local governments could then request BLM to extend the existing private land closure with a firearm discharge closure on BLM-administered land. Because only a limited number of subdivisions adjoining Prineville BLM-administered land have presently closed their boundaries to firearm discharge, only 2,421 acres of BLM land would qualify for a firearm discharge closure of this type at this time. These closures would be expected to reduce firearm discharge opportunities more than in Alternative 1. Additional subdivisions may engage in this process in the future; however, the location and extent of these actions is unknown, as are the possible cumulative effects.

A final firearm discharge cumulative effect discussion centers on proposed closures adjacent to the Lower Crooked Wild and Scenic River corridor. The 1992 Lower Crooked Wild and Scenic River (Chimney Rock Segment) Management Plan directed that discharge of firearms and hunting would be limited to state waterfowl, big game, and upland game seasons. While those river closures have yet to be put in place, there is an expectation that those closures will be implemented in the future. Cumulatively the existing WSR direction combined with the proposed RMP firearm discharge closures would restrict target shooting in the area between the Lower Crooked WSR and the Prineville Reservoir (2,763 acres) to a greater extent than Alternative 1. Although additional acreage is being closed to firearm discharge in all action alternatives, the continuity of regulations from river to upland area means the Alternative 2-7 approach would be more understandable, enforceable, and implementable than Alternative 1.

Campfires

The Common to Alternatives 2-7 approach would close an additional 7,113 acres to campfires over Alternative 1, moderately reducing opportunities to enjoy campfires, and providing minimal additional wildfire protection. Indirectly, however, these closures would simplify campfire regulations in the main Steamboat block, and throughout the Smith Rock block. These simplified campfire regulations would make this approach more understandable, enforceable, and implementable than Alternative 1. This approach would also reduce the need for BLM law enforcement officers to educate visitors and enforce the regulations.

Law Enforcement Authority

The Common to Alternatives 2-7 approach would provide BLM law enforcement rangers with increased authority to enforce existing Oregon state and local laws above what is provided in Alternative 1. The indirect effects of this approach would be an increased enforcement of Oregon state and local laws on BLM-administered land, and increased consistency of enforcement of Oregon state and local laws between BLM and non-BLM-administered lands above Alternative 1, although neither of those effects cannot be quantified. From a cumulative standpoint the predicted increase in human populations

and associated increase in recreational use on BLM-administered lands would mean any increase in enforcement of regulations should have a future exaggerated effect above Alternative 1.

Dumping

Alternatives 2-7 would not result in any direct effects, because these alternatives do not identify any site-specific actions. However, closures to motorized vehicles described in the Common to Alternatives 2-7 Recreation section would be expected to have indirect effects on dumping. Areas managed for exclusive non-motorized use would be closed to motorized vehicles, resulting in a probable reduction in the amount of waste dumped within the planning area. In addition, it is probable that an additional number of user-created travelways leading to habitual dumping areas will be closed, either to all vehicles, or at least to full-sized vehicles above the direction provided in Alternative 1. If implemented, these closures would be completed utilizing fences, boulders, and signs. The effects of these probable actions include a reduction in dumping in the closed areas, and a displacement of illegal dumping to adjacent areas, leading to an increase in dumped materials in those adjacent areas. Cumulatively, one can expect that as human populations in Central Oregon increase, so will the amount of illegal dumping. In addition, the Social and Economic Impact Analysis Report for the Upper Deschutes RMP/EIS predicts an increase in the number of people living in poverty, and an increase in the cost of housing. From these predictions one can reasonably assume the poorest Central Oregon residents will experience a decrease in the amount of income available for waste disposal, resulting in an increase in the amount of dumping occurring on BLM lands within the planning area.

Alternative 2

Firearm Discharge

Alternative 2 has six additional areas (5,133 acres) closed to firearm discharge unless legally hunting above those closed in Common to Alternatives 2-7. These closures are generally proximal to urban areas; two of them are managed as ACECs. Compared to current management, these closures provide additional natural and cultural resource protection, and allow for increased opportunities for land users to experience natural quiet and increased perceived safety. In conjunction with motorized closures, this alternative would increase the diversity of recreation opportunities above Alternative 1 by establishing urban, non-motorized areas closed to firearm discharge unless legally hunting. Compatibility would also be improved by providing non-motorized users an opportunity to recreate where the only firearm discharge allowed is hunting. Because of the limited number of closures, this alternative would be more understandable, enforceable, and implementable than the other action alternatives.

Compared to existing management the indirect effects of Alternative 2 firearm discharge closures include minor additional displacement of target shooters from generally small, urban BLM-administered lands with relatively high amounts of recreational use. Although the exact location and amounts of the displacement is unknown, the closures primarily occur on BLM-administered lands between Bend and Redmond, making it reasonable to assume at least some of those target shooters would move to adjacent BLM-administered lands in the Cline Buttes and Bend-Redmond blocks. Cumulatively these closures, along with similar closures implemented by other land management agencies within the cumulative effects analysis area, would be expected to minimally reduce the regional opportunities to discharge firearms above current management, although it is impossible to quantify these effects. Under Alternative 2 the predicted increase in human populations, residential development, and recreational use of natural areas in Central Oregon would be expected to result in the greatest firearm discharge related conflicts among recreational users, and between recreational users and adjacent landowners, except for Alternative 1.

Dumping

There are no specific actions related to dumping in Alternative 2; however, closures to motorized vehicles described in the Recreation section are expected to have indirect effects on dumping. In Alternative 2, 25,699 acres or 6 percent of the planning area would be managed for exclusive non-motorized use, effectively closing these areas to motorized vehicles, resulting in a probable reduction in the amount of waste dumped within the planning area. In addition, it is probable that an additional number of user-created travelways leading to habitual dumping areas will be closed, either to all vehicles, or at least to full-sized vehicles above the direction provided in Alternative 1 (see Common to Alternatives 2-7). If implemented, these closures would be completed utilizing fences, boulders, and signs. Although a quantitative analysis is not possible, it is reasonable to assume Alternative 2 would allow the second-most amount of dumping of any of the alternatives. Compared to the other alternatives, these limited closures provide the second-least amount of natural resource protection and opportunity for visitors to experience an aesthetic natural landscape. Alternative 2 would be expected to require the second-least amount of engineering and design, but the second-greatest amount of ranger presence and enforcement.

Alternative 3***Firearm Discharge***

This alternative would close 128,751 acres, or 30 percent of the planning area, to firearm discharge, the most acreage of any alternative. That acreage includes 8,418 acres closed to all firearm discharge, and 120,333 acres closed to firearm discharge unless legally hunting. Five of the six areas closed to firearm discharge unless legally hunting in Alternative 2 would be closed to all firearm discharge here. These closures would be especially important given their proximity to urban areas and the expected demographic changes predicted for the Central Oregon. In addition, Alternative 3 would close the Badlands, the Tumalo block, most of the La Pine block, and parts of the Mayfield and Millican Plateau blocks to firearm discharge unless legally hunting. Compared to Alternatives 1 and 2, these actions would improve natural resource protection by providing additional protection to vegetation and wildlife. Combined with closures to all motorized travel, these firearm discharge closures would provide the most recreational opportunities for experiencing non-motorized, target shooting-free areas, emphasizing natural quiet, high visual quality, and increased perceived safety in the planning area. From a compatibility perspective, these closures separate different user groups thereby reducing user conflicts. Compatibility would be emphasized because this alternative separates users to a great degree, reducing user conflicts, but less so than in Alternatives 7 and 5. Because of the additional firearm discharge closures, this alternative would be equally difficult to understand and enforce as Alternatives 5 and 7. Alternative 3 would be the second-least implementable, requiring nearly the greatest management presence (behind Alternative 5).

Compared to the other alternatives, Alternative 3 firearm discharge closures would be expected to displace the second-greatest amount of firearm discharge. Although the exact location and amounts of displacement is unknown, critical Alternative 3 closures would occur in the Steamboat Rock block, and parts of the Mayfield and Cline Buttes blocks, making it reasonable to assume some target shooters will move to adjacent BLM lands in the Bend-Redmond block, and sections of the Mayfield and Cline Buttes blocks still open to firearm discharge activities. Cumulatively these BLM closures to firearm discharge, along with similar closures implemented by other land management agencies within the cumulative effects analysis area, would be expected to moderately reduce regional opportunities to discharge firearms, especially target shooting opportunities. Again, while these effects are not quantifiable, it is reasonable to assume the predicted increase in human populations, residential development, and recreational use of natural

areas in Central Oregon will increase firearm discharge related conflicts among users, and between recreational users and adjacent landowners above the level of conflict without a population increase.

Dumping

The alternatives do not include any specific actions related to dumping in Alternative 3; however, closures to motorized vehicles described in the Recreation section would be expected to have indirect effects on dumping. In Alternative 3, 81,619 acres, or about 20 percent of the planning area would be managed for exclusive non-motorized use, effectively closing these areas to motorized vehicles, resulting in a probable reduction in the amount of waste dumped within the planning area. In addition, it is probable that an additional number of user-created travelways leading to habitual dumping areas would be closed, either to all vehicles, or at least to full-sized vehicles above the direction provided in Alternative 1 (see Common to Alternatives 2-7). If implemented, these closures would be completed utilizing fences, boulders, and signs. Although a quantitative analysis is not possible, based on acres closed to motorized use, it is reasonable to assume Alternative 3 would have less impact on dumping than Alternatives 6, and 7, but more impact than Alternatives 1, 2, 4, and 5. Compared to the other alternatives, these motorized closures would provide the third most amount of natural resource protection, and the third most opportunity for visitors to experience an aesthetic natural landscape. Alternative 3 would be expected to require the third-most amount of engineering and design, but the fifth-least amount of ranger presence and enforcement. Finally, the Recreation section in Alternative 3 closes the main Steamboat Rock block to full-sized vehicles only (while still allowing OHV use); this approach would continue to provide motorized recreation opportunities while reducing the amount of dumping.

Alternative 4

Firearm Discharge

This alternative would close an identical amount of area to all firearm discharge as Alternative 3 (8,418 acres); however, Alternative 4 only closes a limited amount of acreage to firearm discharge unless legally hunting above Common to Alternatives 2-7 (3,639 acres). Except in the Steamboat Block these closures provide less protection to natural and cultural resources than Alternative 3, but more than Alternative 2. Compared to 3, Alternative 4 would also reduce the diversity and compatibility of recreational opportunities by limiting the separation of uses, and establishing special areas managed for particular experiences. Overall aesthetic values would also be reduced compared to Alternative 3, because natural quiet, visual quality and perceived safety would not be provided for to the same degree. The one exception to the general trend in Alternative 4 would be Steamboat Rock. Additional acreage closure in the main Steamboat Rock block to firearm discharge unless legally hunting would improve natural resource protection, provide additional recreational opportunities, improve the aesthetic values of the natural landscape, and improve recreational compatibility in this part of the planning area. Alternative 4 would require more management presence than Alternative 2, but less than Alternatives 3, 5, 6, and 7. Alternative 4 would be easier to understand and enforce, and more implementable than Alternatives 3, 5, 6, and 7, but more difficult to understand and enforce and less implementable than Alternative 2.

Compared to the other alternatives, Alternative 4 firearm discharge closures are expected to displace a relatively small amount of firearm discharge. Although the exact location and amounts of displacement is unknown, based on acres of closure one can expect Alternative 4 would displace more firearm discharge than Alternative 2, but less than Alternatives 3, 5, 6, and 7. The only substantial closure above Common to Alternatives 2-7 would be in the Steamboat Rock area, making it reasonable to assume some target shooters would move to adjacent BLM-administered land in the Bend-Redmond and Cline Buttes blocks. In comparison to the other alternatives, the cumulative effects

of these BLM closures to firearm discharge, along with similar closures implemented by other land management agencies within the cumulative effects analysis areas, are expected to be relatively minor. Again, while these effects are not quantifiable, it is reasonable to assume the predicted increase in human populations, residential development, and recreational use of natural areas in Central Oregon would increase firearm discharge related conflicts among users, and between recreational users and adjacent landowners.

Dumping

With respect to dumping, the alternatives do not include any specific actions in Alternative 4; however, closures to motorized vehicles described in the Recreation section would be expected to have indirect effects on dumping. In Alternative 4, 28,091 acres, or 7 percent of the planning area would be managed for exclusive non-motorized use, effectively closing these areas to motorized vehicles, resulting in a probable reduction in the amount of waste dumped within the planning area. In addition, it is probable that an additional number of user-created travelways leading to habitual dumping areas would be closed, either to all vehicles, or at least to full-sized vehicles above the direction provided in Alternative 1 (see Common to Alternatives 2-7). If implemented, these closures would be completed utilizing fences, boulders, and signs. Although a quantitative analysis is not possible, based on acres closed to motorized use, it is reasonable to assume Alternative 3 would have less impact on dumping than Alternatives 3, 5, 6, and 7, but more impact than Alternatives 1 and 2. Compared to the other alternatives, these motorized closures would provide the third-least amount of natural resource protection, and the third-least opportunity for visitors to experience an aesthetic natural landscape. Alternative 3 would be expected to require the third-least amount of engineering and design, but the fifth-most amount of ranger presence and enforcement. Finally, the Recreation section in Alternative 4 closes the main Steamboat Rock block to full-sized vehicles only (while still allowing OHV use), providing continued motorized recreation opportunities while reducing the amount of dumping.

Alternative 5

Firearm Discharge

This alternative closes the second most acres of BLM-administered land to firearm discharge. While Alternative 5 would include identical closures to all firearm discharge as established in Alternative 3 (8,418 acres), it would close a different set of acres to firearm discharge unless legally hunting (109,010 acres). This alternative would provide for the second most compatibility between recreational users, and between recreational users and adjacent landowners in urban and residential areas (Alternative 7 provides the most). This is reflected in Cline Buttes, La Pine, the Mayfield block, and the Crooked River parcels where large areas would be closed to firearm discharge unless legally hunting. Although this alternative would provide improved compatibility because of its increased management of user conflicts in urban and residential areas, overall it would close less land to firearm discharge than Alternative 3, and would not provide as diverse recreational opportunities as Alternatives 3 and 7 (although it would be more compatible and diverse than Alternatives 2, 4, and 6). Natural and cultural resource protection would exceed the protection provided in Alternatives 2, 4, 6, and 7 because a majority of the damage to these resources occurs in proximity to urban and residential centers, and would be largely protected by a closure to firearm discharge unless legally hunting. The aesthetic values of the natural landscape, including solitude and distinctive land forms, would be moderately protected, less than in Alternatives 3 and 7, but more than in Alternative 2, 4 and 6. Because of its proposed firearm discharge closures and urban orientation, Alternative 5 would require the most management presence and would be of equal difficulty as Alternatives 3 and 7 to understand and enforce. Alternative 5 would be the least implementable of any alternative.

Compared to the other alternatives, Alternative 5 firearm discharge closures would be expected to displace the most amount of firearm discharge (behind Alternative 7). Although the exact location and amounts of displacement is unknown, the urban characteristics of the closure areas in Steamboat Rock and Cline Buttes would directly affect the amount of expected displacement. As noted above, Alternative 5 would close fewer acres to firearm discharge than Alternative 3, but more target shooting would occur in Cline Buttes than in the Badlands, hence the change in expected displacement. It is reasonable to assume many of the displaced firearm users would move to adjacent publicly-owned lands, including the Bend-Redmond block of BLM-administered land, and the Crooked River National Grasslands just north of the planning area. In comparison to the other alternatives, the cumulative effects of these BLM closures to firearm discharge, along with similar closures implemented by other land management agencies within the cumulative effects analysis area, would be expected to be substantial. Again, while these effects are not quantifiable, it is reasonable to assume the predicted increase in human populations, residential development, and recreational use of natural areas in Central Oregon will increase firearm discharge related conflicts among users, and between recreational users and adjacent landowners above the level of conflict without a population increase.

Dumping

With respect to dumping, the Public Health and Safety alternatives do not include any specific actions in Alternative 5; however, closures to motorized vehicles described in the Recreation section would be expected to have indirect effects on dumping. In Alternative 5 54,548 acres, or 14 percent of the planning area would be managed for exclusive non-motorized use, effectively closing these areas to motorized vehicles, resulting in a probable reduction in the amount of waste dumped within the planning area. In addition, it is probable that an additional number of user-created travelways leading to habitual dumping areas would be closed, either to all vehicles, or at least to full-sized vehicles above the direction provided in Alternative 1 (see Common to Alternatives 2-7). If implemented, these closures would be completed utilizing fences, boulders, and signs. Although a quantitative analysis is not possible, based on acres closed to motorized use, it is reasonable to assume Alternative 5 would have a greater impact on dumping than Alternatives 1, 2, and 4, but less than Alternatives 3, 6, and 7. Compared to the other alternatives, these motorized closures would provide the fourth-most amount of natural resource protection, and the fourth-most opportunity for visitors to experience an aesthetic natural landscape. Alternative 5 would be expected to require the fourth-most amount of engineering and design, and the fourth-most amount of ranger presence and enforcement.

Alternative 6

Firearm Discharge

This alternative emphasizes effective wildlife habitats outside areas most likely to be affected by residential and urban development. Three of the five urban-related parcels that would be closed to all firearm discharge in Alternatives 3-5 (the airport allotment, the southern parcel in the Tumalo block, and the parcel north of Rickard Road, South of Highway 20) would now be closed to firearm discharge unless legally hunting. This would leave 6,411 acres closed to all firearm discharge, and 57,674 acres closed to firearm discharge unless legally hunting.

This alternative would provide greater protection for vegetation and wildlife than Alternatives 2 and 4, but less than Alternatives 3, 5, and 7. The focus on natural and cultural protection would reduce the compatibility between recreational uses, and allow for more user conflict than Alternatives 3, 5, and 7 but less than Alternatives 2 and 4. The diversity of recreation opportunities would be reduced because of fewer restrictions in the high conflict urban areas, providing less diversity than Alternatives 3, 5, and 7, but more diversity than Alternatives 2 and 4. The protection of aesthetic values of the natural

landscape would be greater than in Alternatives 2 and 4, but less than Alternatives 3, 5, and 7, and would move the area of emphasis from urban to rural. Because management is generally easier in rural areas compared to urban areas, this alternative would require less management presence, be easier to enforce, be easier to understand the regulations compared to Alternatives 3, 5, and 7, and harder than in Alternatives 2 and 4. Implementing this alternative would be easier than Alternatives 3, 5, and 7, but harder than Alternatives 2 and 4.

Compared to the other alternatives, Alternative 6 firearm discharge closures would be expected to displace the third-least amount of firearm discharge, only displacing less than in Alternatives 2 and 4. Although the exact location and amounts of displacement is unknown, this alternative would close the third-least amount of BLM-administered land to firearm discharge, and would not close any previously identified intensive firearm discharge areas. In comparison to the other alternatives, the cumulative effects of these BLM closures to firearm discharge, along with similar closures implemented by other land management agencies within the cumulative effects analysis area, would be expected to be minimal. Again, while these effects are not quantifiable, it is reasonable to assume the predicted increase in human populations, residential development, and recreational use of natural areas in Central Oregon will increase firearm discharge related conflicts among users, and between recreational users and adjacent landowners above the level of conflict without a population increase.

Dumping

With respect to dumping, the Public Health and Safety alternatives do not include any specific actions in Alternative 6; however, closures to motorized vehicles described in the Recreation section would be expected to have indirect effects on dumping. In Alternative 6 83,804 acres, or 21 percent of the planning area would be managed for exclusive non-motorized use, effectively closing these areas to motorized vehicles, resulting in a probable reduction in the amount of waste dumped within the planning area. In addition, it is probable that an additional number of user-created travelways leading to habitual dumping areas would be closed, either to all vehicles, or at least to full-sized vehicles above the direction provided in Alternative 1 (see Common to Alternatives 2-7). If implemented, these closures would be completed utilizing fences, boulders, and signs. Although a quantitative analysis is not possible, based on acres closed to motorized use, it is reasonable to assume Alternative 6 would have a greater impact on dumping than Alternatives 1-5, but less impact than Alternative 7. Compared to the other alternatives, these motorized closures provide the fourth-most amount of natural resource protection, and the fourth-most opportunity for visitors to experience an aesthetic natural landscape. Alternative 5 would be expected to require the fourth-most amount of engineering and design, and the fourth-most amount of ranger presence and enforcement.

Alternative 7

Firearm Discharge

This alternative takes an approach that combines many of the features of the previous alternatives in a manner that attempts to meet, to the greatest degree possible, the needs of all of the issue areas. Of any alternative, Alternative 7 would close the most BLM land to all firearm discharge (10,500 acres), but the third-most acreage to firearm discharge unless legally hunting (82,631 acres). This alternative emphasizes maintaining wildlife habitat, and would provide the second-greatest protection to vegetation and wildlife of all the alternatives. This alternative would also emphasize intensive visitor management, and with the motorized travel closures, provide for nearly maximum recreational opportunities for enjoying natural quiet, high visual quality, and increased perceived safety, behind Alternative 3. From a compatibility standpoint this set of firearm discharge closures would maximize the separation of different user groups, resulting in the greatest reduction of user conflicts. Because this alternative calls for nearly maximum separation of users and management presence, it would be equally difficult to understand and enforce as Alternatives 3 and 5.

Compared to the other alternatives, Alternative 7 firearm discharge closures would be expected to displace the third-greatest amount of firearm discharge. Although the exact location and amounts of displacement is unknown, this alternative would close the most acreage to all firearm discharge, including closures in the Steamboat Rock and Cline Buttes blocks (areas presently utilized by target shooters). In comparison to the other alternatives, the cumulative effects of these BLM closures to firearm discharge, along with similar closures implemented by other land management agencies within the cumulative effects analysis area, would be expected to be the third-greatest of any alternative (behind Alternatives 3 and 5). Again, while these effects are not quantifiable, it is reasonable to assume the predicted increase in human populations, residential development, and recreational use of natural areas in Central Oregon will increase firearm discharge related conflicts among users, and between recreational users and adjacent landowners above the level of conflict without a population increase.

Dumping

With respect to dumping, the Public Health and Safety alternatives do not include any specific actions in Alternative 7; however, closures to motorized vehicles described in the Recreation section are expected to have indirect effects on dumping. In Alternative 7 87,832 acres, or 22 percent of the planning area would be managed for exclusive non-motorized use, effectively closing these areas to motorized vehicles, resulting in a probable reduction in the amount of waste dumped within the planning area. In addition, it is probable that an additional number of user-created travelways leading to habitual dumping areas would be closed, either to all vehicles, or at least to full-sized vehicles above the direction provided in Alternative 1 (see Common to Alternatives 2-7). If implemented, these closures would be completed utilizing fences, boulders, and signs. Although a quantitative analysis is not possible, based on acres closed to motorized use, it is reasonable to assume Alternative 7 would have greatest impact on dumping than any other alternative. Compared to the other alternatives, these motorized closures would provide the greatest amount of natural resource protection, and the greatest opportunity for visitors to experience an aesthetic natural landscape. Alternative 7 would be expected to require the greatest amount of engineering and design, but the least amount of ranger presence and enforcement. Finally, the Recreation section in Alternative 7 would close the main Steamboat Rock block to full-sized vehicles only (while still allowing OHV use). This approach would continue to provide motorized recreation opportunities while reducing the amount of dumping.

Archaeology

Summary

All alternatives would continue management direction to protect archaeological resources from project effects and consult with affected tribes about project undertakings in accordance with existing laws and regulations. Alternative 1 would have the greatest potential for effects to archaeological resources in general, whereas the effects to those resources under Alternatives 2-7 would be much the same. Effects to “at-risk” significant archaeological resources that would be expected under Alternative 1 would be reduced under Alternatives 2-7 due to the designation of ACECs. ACEC designation would limit or eliminate activities that could damage or diminish the integrity of archaeological resources. Similarly, potential for effects to archaeological resources that would be anticipated under Alternative 1 would be reduced under Alternatives 2-7 by emphasizing non-project related surveys. Non-project related surveys would provide much needed information about the kind of effects that are occurring to cultural materials in areas of high probability for the location of significant sites. In addition, the potential to stabilize and interpret “at-risk” significant archaeological resources, in particular, and protect and

preserve non-renewable resources, in general, would be greatly improved as a result of criteria developed for identifying and prioritizing treatment of “at-risk” resources and non-project related surveys.

Assumptions

Archaeological Resources

Each alternative would comply with the various federal laws, regulations, and policies intended to mitigate project effects to archaeological resources.

Archaeological resources would be located, protected, developed, interpreted, and preserved in accordance with existing legal authorities.

Appropriate tribal governments would be consulted to ensure their interests are taken into account prior to decisions to implement plan allocations, goals, and objectives.

Archaeological Resources and “At-Risk” Significant Archaeological Resources

Alternative 1

Under current conditions, impacts that are presently occurring to archaeological resources and “at-risk” significant archaeological resources would continue to diminish the integrity of those resources without additional site-specific decisions to alter uses.

Common to Alternatives 2-7

Most “at-risk” resources are protected by limiting activities that could damage them within the immediate vicinity of the resource or by designating ACECs that would emphasize interpretation or limit activities in large areas.

Conducting non-project related inventories across the planning area would have an overall beneficial effect on all forms of archaeological resources. Such inventories would, at once, provide the BLM with better information about the amount, extent, and nature of those resources within the planning area (and by extension, how best to manage them), while at the same time identify representative samples of archaeological data from which scientifically based conclusions about the past could be established.

Managing significant caves in their natural state with an emphasis on interpretation and, where applicable, for appropriate recreational uses, would have a positive effect on archaeological resources. Currently, all caves within the planning area have not been inventoried to determine their resource values. However, prior to authorizing cave uses, various legal requirements would have to be met to ascertain if public access limitations or restrictions are needed.

Future anticipated actions to fence the Redmond Caves parcel and repair the fence around Pictograph Cave would prevent unauthorized motorized vehicle access to the areas. This limitation to public access would have a positive effect on archaeological resources in general and “at-risk” significant resources in particular. Such limitations would reduce the dumping, vandalism, soil compaction, and other surface disturbance that is occurring under present conditions.

Objectives that include a designated trail system, limited to foot traffic only, for the Steelhead Falls area and closing and rehabilitating user created trails not part of the designated system would have a beneficial effect on archaeological resources. Such a trail system would allow the public to visit much of the area while directing visitors away from fragile, non-renewable resources that are easily damaged.

Interpretive development and education products for “at-risk” significant archaeological resources would have a positive effect for both the public and the resource. Interpretive

development would provide needed measures to stabilize and safeguard threatened resources, while educational products would inform the public about the value, sensitive nature, and geographic importance of those resources.

Analysis of the Alternatives

Archaeological Resources and “At-Risk” Significant Archaeological Resources

Common to All Alternatives

Each alternative makes allocation or management emphasis decisions that would affect the resource base of non-renewable archaeological resources. However, prior to decisions to implement federal or federally licensed undertakings, various laws and regulations require that an agency official take into account the effects of those undertakings on archaeological resources. Similarly, prior to implementation of federal undertakings, various legal authorities require federal agencies to make a reasonable and good-faith effort to take into account the comments and concerns of local Indian tribes to determine if tribal interests would be affected by project activities. The Wagon Roads ACEC in Township 17, Range 12, and Section 1 would continue to protect the historical features for which the ACEC was designated. Other existing ACECs, RNAs, and WSAs would generally have a beneficial effect on archaeological resources where management actions restrict detrimental uses in those areas. Given those considerations, it is expected that effects to archaeological resources would be kept to the minimum allowable by law. Actual effects cannot be quantified until site-specific projects are identified and archaeological surveys, site inventory and documentation is completed.

Alternative 1

Alternative 1 would continue the management direction provided for archaeological resources found in the Brothers/La Pine RMP. Under this alternative the BLM would meet its legal responsibilities to protect archaeological resources from federal or federally licensed ground-disturbing activities. The management strategy to protect archaeological sites from the effects of project activities would be to avoid them through project modifications. Segments of historic Huntington Road would continue to be recognized as an ACEC and subject to the management guidelines found in the Brothers/La Pine RMP. Alternative 1 does not provide guidance about how the BLM would determine the nature of the archaeological resource base across the planning area, or how it would identify and manage “at-risk” significant archaeological resources threatened by human activities or natural processes. Under this alternative, the expected effects to those “at-risk” resources would continue the trends in resource condition as noted in the Affected Environment.

Although Alternative 1 provides minimal legal protection for archaeological resources from federal or federally licensed undertakings through avoidance, it does not provide a management strategy that would 1) reduce non-project related effects to resources due to an increasing local population base and visitation rate to public lands, 2) provide direction for determining the amount, extent, and nature of archaeological resources in the planning area, and 3) develop a criteria for identifying “at-risk” significant archaeological resources and prioritizing them relative to a treatment schedule. Impacts under this alternative would be particularly threatening to “at-risk” significant archaeological resources. Unauthorized motorized and mechanized vehicle access to the Redmond Caves parcel, Tumalo Canals, and Pictograph cave would continue to diminish the integrity of those historical resources unless site-specific mitigations were implemented.

Similarly, without a special management designation for the Tumalo Canals, potential a material site identified for possible gravel extraction immediately adjacent to the

historic canals would affect the local landscape, topographic features, and vegetation, in addition to creating dust and noise. Those activities, in turn, have the potential to affect the integrity of location, design, and feeling that contribute to the significance of the historic feature. In light of those considerations, Alternative 1 would have the greatest potential effect on archaeological resources due to soil compaction, vandalism, artifact collection, erosion, surface disturbance, mineral material extraction, and refuse dumping. By extension, those factors would contribute to a deficiency in resource diversity and information potential.

Common to Alternatives 2-7

Alternatives 2-7 would carry forward the minimal legal responsibilities provided for archaeological resources found in Alternative 1. However, in contrast to that alternative, Alternatives 2-7 establish a more affirmative approach for the management of archaeological resources, in general, and “at-risk” significant archaeological resources, in particular. In keeping with that proactive approach, the Wagon Roads ACEC is carried over into Alternatives 2-7. Here, however, two segments of the existing Wagon Roads ACEC are removed from ACEC designation, due to lack of importance and relevance, and two segments of the historic Horner and Bend / Prineville Roads are added to the Wagon Roads ACEC. Those segments of historic roads that are included in 2-7 are considered eligible to the National Register of Historic Places. Alternatives 2-7 also provide additional proactive management guidance in support of conducting non-project related inventories to determine the amount, extent, and nature of archaeological resources across the planning area.

Alternatives 2-7 establish criteria for identifying “at-risk” significant archaeological resources and recommends a method for prioritizing proactive treatment for those resources. A segment of the historic Tumalo Canals is one such “at-risk” significant resource. The feature is considered eligible to the National Register of Historic Places. Alternative 2-7 would designate approximately 1,050 acres surrounding the historic features. The area would be designated as an individual ACEC only in Alternatives 2, 5, 6, and 7. However, in Alternative 3 and 4 it would be combined with another ACEC where it would receive the same management direction as in Alternatives 2, 5, 6, and 7. Consequently, it would be managed by the same guidelines across all action alternatives. Other identified “at-risk” resources that would be managed in a more proactive manner in Alternatives 2-7 than under existing conditions include: Redmond Caves, Steelhead Falls, and Pictograph Caves. The criteria developed to manage “at-risk” significant archaeological resources also provides for including additional significant, threatened resources to the list, should those resources be discovered during future inventories. Similarly, treatment of caves, in general, would emphasize a more proactive management approach than under current conditions.

Effects to archaeological resources and “at-risk” significant archaeological resources would generally be the same under all action alternatives. The approximately 875 acre Wagon Roads ACEC would restrict some uses within the boundaries of the ACEC. Mining of saleable materials would be permitted within one and a half miles of the ACEC but would not be allowed within its boundary to protect the integrity of location, feeling, setting, and design that contribute to the significance of the historic roads. Military tracked vehicles and OHVs would be allowed to cross the historic roads at designated places within the ACEC but would be restricted from traveling over the length of the historic roads. Woodcutting would occur outside of the 300 foot buffer on either side of the historic roads but would not be allowed within the ACEC. No motorized vehicles, mining activities, woodcutting, or shooting would be permitted along the one mile segment of the ACEC within the fence enclosure located in Township 17, Range 12, Section 1. Special recreation permits for activities that could reduce the integrity of the roads would not be granted. All other forms of recreation that do not affect the resources for which the ACEC was designated would be encouraged. Restricting the forgoing activities would reduce erosion and soil displacement and compaction to the roads and

their associated features. By restricting those activities, the potential for degradation to the historic property would be reduced and opportunities for interpretation and public education products would be increased. Similarly, completing a non Section 106 cultural resource survey along the roads would document the full extent and nature of the historic features and would provide important information to help identify how best to protect and manage the resource.

Similar to the Wagon Roads ACEC, designating the 1,050 acres around the Tumalo Canals as an ACEC, or providing guidelines for their protection in other ACEC designations, would restrict some uses. Mining of saleable materials would not occur within the ACEC boundaries. Livestock grazing and horseback riding would be allowed within the ACEC but would be restricted from entering the 335 acres where the historic canals are located. Motorized and mechanized vehicle use would be allowed on designated trails in the vicinity of the ACEC but would not be permitted within the ACEC boundaries. Dispersed camping and new discretionary rights-of-ways would be allowed on public lands outside of the ACEC but would not be allowed inside the ACEC. Restricting the forgoing activities would reduce erosion, soil compaction, vandalism, and displacement of cultural materials along the historic canals and to their associated features. By reducing those forces affecting the site, degradation would occur at a much slower rate than under existing conditions and opportunities for interpretation and public education products would be increased. Similarly, completing a non Section 106 cultural resource survey along the historic canal segment would document the full extent and nature of the feature that would provide important information about how to best protect and manage the resource.

In light of the forgoing discussion, by emphasizing a more proactive approach to managing archaeological resources and “at-risk” significant archaeological resources in Alternatives 2-7, there would be a minimal effect relative to other resource issues. In contrast to that, by limiting uses in certain areas, conducting surveys to determine the nature and extent of the resource base across the planning area, designating ACECs, and applying a criteria for identifying and prioritizing treatment for “at-risk” significant resources, Alternatives 2-7 would have an overall beneficial effect on archaeological and “at-risk” significant archaeological resources.

Indian Sacred Sites

Summary

All alternatives would continue management direction to the extent practical, permitted by law, and not clearly inconsistent with essential agency functions to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners. In addition, each alternative would continue management direction to avoid adversely affecting the physical integrity of such sacred sites wherever possible.

Assumptions

Each alternative would comply with the various federal laws, regulations, and policies intended to protect and preserve Indian religious practices.

The agency official would be responsible for ensuring that the BLM operates within a government-to-government relationship with federally recognized tribal governments relative to sacred sites and other tribal interests prior to decisions to implement plan allocations, goals, and objectives.

Analysis of the Alternatives

Common to All Alternatives

Each alternative makes allocation or management emphasis decisions that would potentially affect Indian sacred sites. However, prior to implementation of federal undertakings, various legal authorities require federal agencies to make a reasonable and good faith effort to take into account the affect of their undertakings on Tribal interests. Given that consideration, it is expected that affects to Indian sacred sites or access to those sites by Indian religious practitioners would be kept to the minimum allowable by law.

Social and Economic

Summary

This section describes the important social and economic effects of implementing the alternatives described in Chapter 2. The alternatives primarily affect social or economic values indirectly, as a result of land use allocation or allowable use decisions that affect future uses of public lands or conditions under which uses would be allowed, or as a result of expected outcomes from reasonably foreseeable actions that would likely be taken to implement the RMP. These include land ownership classifications and regional transportation corridor allocations that affect community needs; lands available for future mineral sales or targeted for restoration or fuels treatment reductions that are potential economic contributors to local or regional economies; land ownership classifications, scenic value, and recreation emphases that affect amenity values.

The planning area is surrounded and profoundly influenced by growth and economic development in Central Oregon. The associated build-out of rural and urban lands and increase in recreational and commercial demands on BLM-administered lands is by far the most significant social and economic influence in the region. Central Oregon is a popular tourist and retirement destination, and the contributions of recreation and tourism are important contributors to most of the local economies. Although the BLM – administered lands are, for the most part, not the premier draw for the area, lands within the planning area provide an ever-growing locally important source of amenity and recreational values as well a continued base for uses such as livestock grazing, aggregate mining, transportation rights-of-way, and land sale or exchange. Public lands in the planning area are important to the communities as a part of their cultural identities and decisions about how those lands will be used in the future affect - to varying degrees - the economies of local communities and the land available for future development.

“Common to All Alternatives” represents existing management direction that would not be changed by any of the individual alternatives. An emphasis would continue to be placed on hazardous fuels reduction through prescribed burning and mechanical treatments to minimize wildland fire damage to life and property. Livestock grazing would continue with at least 72 percent of the current authorized use. The effects relating to leasable and locatable mineral development are expected to be minor owing to the low potential for development. At least 300,000 acres are available for mineral material sales under all alternatives and ODOT could save up to \$1.33 million per year by utilizing public sources of mineral materials (aggregate). There are no changes to the commercial forest land allocations or the firewood permitting process, and due to adequate resource supplies, no change in the socioeconomic effects is expected. Enough lands in planning area would be designated for military use in all alternatives for the OMD to qualify for direct congressional funding and a training center upgrade; the economic benefits are expected to remain at 2002 levels. Visitor spending associated with recreation activities on BLM lands in the planning area will continue to provide economic benefits. The proliferation of user-created roads confuses the public’s understanding of designated

road systems, contributes to illegal dumping and provides easier access to public lands. The obliteration of user-created roads would restrict access but would also reduce noise, dust, and illegal dumping.

Assumptions

On-going Activities

The Prineville District of the BLM and the Deschutes and Ochoco National Forests and Crooked River National Grassland have ongoing activities within the planning area. These include land exchanges, forest and fuel management activities, as well as fencing and restoration projects.

For a detailed list of those projects see Deschutes and Ochoco National Forests Website, Central Oregon Public Lands Section of Projects (Deschutes and Ochoco National Forests, 2003), which is incorporated by reference. Generally, these include plans and activities to enhance or maintain resource values on public lands managed by the Ochoco National Forest and Crooked River National Grassland and the Deschutes National Forest. For example, both the Deschutes and Ochoco National Forests have forest plans that guide land use management decisions within each forest. In conformance with those plans, each forest also has proposed or ongoing projects that include vegetation management, forest and fuel management, campground expansions, resort improvements, trail maintenance, road reconstructions, land conveyances and master plans (Deschutes and Ochoco National Forests, 2003).

Community Needs

Communities within the planning area are economically interdependent and are working to maintain individual identities. Public lands are important to maintain generally undeveloped separation between the communities, and to support uses that contribute to local, regional, and national economies.

Several local city and county comprehensive plans and planning efforts also have an influence on land uses within the planning area. These include the Redmond 2020 Comprehensive Plan (City of Redmond, 2001), the Bend Area General Plan (City of Bend, 1998), the Deschutes County Community Plan (Deschutes County, 2001), and the Crook County Natural Resource Plan (in development). The region also has several collaborative regional planning efforts underway including a Regional Problem Solving effort just beginning in Deschutes County, the Redmond Area Collaborative Planning Project, and the City of Redmond Urban Reserve Plan. The Prineville District of the BLM is one of the partners in these collaborative projects. The region's rapid pace of growth, quality of life issues, projected land use needs, and concerns about the supply of land for commercial, industrial and recreational uses are reflected in these collaborative planning projects (Central Oregon Collaborative Projects, 2003).

In the Central Oregon area, there are short-term (less than 20 years) and long-term (20 years +) demand for lands to support community infrastructure described below.

Redmond - In its analysis of Redmond Urban Growth Reserve land needs (for a period 20 to 50 years into the future), the City of Redmond projects that there would be a net land deficit of approximately 5,500 acres of available buildable lands to provide for the projected 20-year population growth. Deschutes County and the City of Redmond have also identified a need for approximately 300 acres for expansion of the Deschutes County fairgrounds to accommodate expected future uses. Lands needed to support suitable for relocation of Highway 126 outside of the runway protection zone and to relieve the potential failure of Yew Street interchange have also been identified.

La Pine – Deschutes County anticipates a need for approximately 400 acres for development of a new airport in La Pine (Coffman Associates, 2002), and approximately

750 acres for expansion of sewer system infrastructure, treatment and holding facilities near the same area. The community has also expressed desires in the past for lands to support a variety of parks and other open-space developments.

Prineville – has an interest in acquiring Barnes Butte for future park development.

Nearly all of the lands designated for possible community expansion under all alternatives are presently zoned Exclusive Farm Use (EFU) by Deschutes and Crook Counties. EFU zoning limits development that would conflict with agriculture and prevents farmland from being divided into parcels too small for commercial agriculture. Open space uses such as parks and development of open space recreation areas (including camping and recreation vehicle park facilities) are considered likely possible future land uses that would be permitted under EFU zoning. Other uses would require future zone changes.

Ecosystem Health and Diversity

There are some vegetation treatments that are reasonably anticipated under all alternatives. Although the amount of expected treatments varies by alternative, there are some common assumptions used to estimate the economic implications of these projected outputs.

The economic benefit to private property owners from BLM's fire and fuels management programs is the avoided costs that property owners would have to pay to ensure or otherwise protect themselves and their property from fire damage in the absence of BLM programs. The complexities of insurance impacts and potential for litigated compensation for negligence make it very difficult to quantify these net avoided costs. Instead, for purposes of this analysis, estimates of BLM's future annual vegetative treatment program costs were used as a representation of the economic and social benefit to the neighboring communities from these fire/fuels and other vegetative treatments. Vegetative treatments are performed to meet a variety of land management objectives, including forage improvement, habitat restoration, promoting ecosystem health and diversity, and to contribute to the social and economic needs of local communities. Most of the cost of fuel and vegetative treatment activities is in preparation and monitoring. Costs of implementing the work are relatively low, with prescribed burning costing between \$10 and \$40 per acre, and mechanical treatment activities costing between \$30 and \$100 per acre. There is assumed to be no change in the immediate future to expenditures for fire suppression and preparedness.

Land Uses

Livestock Grazing

Table 4-15 in the Livestock Grazing section of this chapter summarizes the changes in the total animal unit months (AUMs) available in the planning area for the current situation, and for each alternative. Table 4-16 (same location) shows the expected change in cow / calf sales by alternative.

The alternatives present a range of solutions for reducing conflict, some of which involve making some allotments unavailable for livestock grazing.

As described in the Livestock Grazing section of this chapter, the effects analysis is based on several assumptions (see that section for more details). The economic analysis estimates the range of effects under both full-flexibility and limited flexibility scenarios. Neither scenario represents all permittees. Actual effects will be dependent on the private business decisions made by individual permittees based on their individual circumstances.

Most Alternative 7 forage reductions would not take place unless the grazing permittee voluntarily relinquishes his/her permit. This is assumed to reduce effects on the individual permittee, though the impact on the local economy would be the same as if the closure were forced.

Authorized use was used to compare alternatives because it more accurately reflects use than does active preference. Active preference is generally the maximum available on a specific permit, while authorized use is the forage actually applied for and used. Authorized AUMs for the current situation are displayed but B/LP RMP direction is used for comparison with UDRMP alternatives. This is because the amount of vacant and unallocated AUMs in the current situation is not necessarily typical, since the BLM has deferred requests for permits for these parcels pending completion of the UDRMP. For analysis purposes, B/LP direction is assumed to more accurately reflect baseline conditions of the No Action Alternative.

The No Action Alternative (Alternative 1) assumes that demand exists for currently available but unallotted AUMs, and permits will be issued following completion of the RMP, consistent with existing management direction.

The action alternatives are compared to the No Action Alternative to display the differences in future outcomes by alternative relative to the projected outcome under continued implementation of existing management direction.

The economic analysis uses the 1998-2002 average cattle/calves inventory for Deschutes and Crook Counties (Jefferson and Klamath represent small portions of the planning area and are not included in this number), less calves inventory of about 40 percent (to be consistent with BLM, which counts each cow-calf pair as one AUM). This is 49,484 AUMs, of which the BLM current authorized use of 18,342 represents 3.09 percent. The average length of the grazing season was assumed to be three months. Historic records indicate the 1998-2002 average value of cattle and calf sales in Crook and Deschutes Counties was \$25,991,000 (Oregon State University Extension Service, Oregon Agricultural Information Network, 2003, <http://ludwig.oregonstate.edu/oain/>).

Minerals

BLM administers claims for the extraction of locatable minerals (such as precious metals), leasable minerals (such as oil and gas), and salable minerals (including sand and gravel or aggregate) from its lands. However, the alternatives do not substantively change any existing direction regarding these materials. Combined with the low probability of development of locatable and leasable minerals within the reasonably foreseeable future, there are expected to be no social or economic effects associated with the decisions in this plan.

As described in the Minerals section of this chapter, the primary demand for minerals in the planning area is for aggregate. The potential for mineral material development under sales and free use contracts is high within the Planning Area because of the rapidly expanding population and the corresponding demand for aggregate material. Since many of these potential sites are near rural residential areas, the potential for conflicts with residents is also high.

Initial studies by Oregon Department of Transportation (ODOT) suggest that considerable supplies of aggregate exist on BLM lands within the Planning Area. In addition, ODOT foresees considerable future demand for aggregate for new road construction and maintenance of existing roads. They have estimated an average annual demand over the next twenty years at about 135,000 cubic yards. The Oregon Department of Geology and Mineral Industries (DOGAMI) also estimates considerable non-ODOT demand for aggregate in Deschutes County over the next fifty years. According to DOGAMI, annual aggregate consumption in Deschutes County will reach

about 1,110,000 cubic yards between 2000 and 2010, and this consumption will likely increase by about 100,000 every ten years thereafter (ODOT, 1998). For the purposes of the impact analysis, BLM anticipates accommodating ODOT annual aggregate needs of 135,000 cubic yards in all alternatives. This analysis also assumes that the cost savings are “returned” to the region by additional roadway construction that ODOT would otherwise not be able to fund in the region.

Forest Products

Commercial purchasers and individual permittees currently harvest timber, juniper boughs, firewood, and other products from BLM managed lands in the Planning Area.

Timber

Commercial timber harvest contributes substantial direct regional economic benefits (jobs associated with logging and milling) and indirect benefits from secondary wood product manufacturing and timber-related industries and services. State governments also benefit directly through receipt of four percent of revenues from BLM timber sales, firewood and other special forest products collections. The state of Oregon also collects Oregon Forest Products Harvest and Privilege Tax of about \$2.87 per 1000 board feet of harvest on BLM lands (based on March 2002 tax figures).

Timber harvested commercially has been one of the most valuable forest products on BLM lands. Compared to the timber available from National Forest lands in the region, the amount of timber available for harvest on BLM’s managed lands in the Planning Area is quite small. In the La Pine portion of the Planning Area, BLM manages 40,134 acres of lodgepole and ponderosa pine as commercial forest, including 1,826 acres that are managed by BLM within the La Pine State Park. These commercial forests represent 2.4 percent of the total commercial forest land base in Deschutes County. In the northern portion of the Planning Area, BLM manages about 1080 acres of commercial forest – less than one percent of the commercial forests in Deschutes and Crook counties.

For the next few decades, as La Pine timber stands regenerate and grow to commercial size, BLM will emphasize timber harvests of small diameter trees (generally, 4 to 12 inches dbh [diameter at breast height]) as part of forest restoration and fuels reduction treatments.

Special Forest and Range Products

The BLM issues permits for the collection of vegetative products. These include juniper boughs used in making furniture and other items such as transplants for landscaping, Christmas trees, lichen, juniper berries, sage leaves and other miscellaneous products. With the exception of juniper boughs and firewood (discussed later), harvest of these products on BLM managed lands in the Planning Area is a minor activity. Most of the permits to harvest juniper boughs are sold to commercial operators. The boughs are used in the making of Christmas wreaths which are then sold at retail throughout the country. In the period 1996-2000 an average of 170,113 pounds of juniper boughs were sold on the BLM Prineville District – of which an estimated 75 percent came from the within the Planning Area. The 2000 and 2001 juniper bough harvests increased substantially – averaging about 640,000 pounds. Future juniper bough production from BLM lands in the region are projected to stabilize at the last three years average of about 500,000 pounds. Based on a permit price of \$0.05 per pound for juniper bough harvests, the juniper bough harvests generated \$25,000 in permit receipts to the federal government over the last three years of harvest, which averaged about 500,000 pounds per year (from 2000 to 2002).

About a dozen individuals currently make their living from juniper furniture production in the region. According to interviews with several of these individuals, about one third of their raw juniper was obtained from private property, one third from U.S. Forest Service land and one third from BLM land (Burleigh, personal communication,

2003). Furniture makers estimate that they typically require 10 to 12 cords of juniper annually and that about three to five percent of the trees within most old growth stands in the region are living and suitable for furniture. Furniture makers individually select the pieces they collect for their aesthetic suitability and estimate that, on average, their raw material costs represent 5 to 10 percent of the final price of their goods (Burleigh, personal communication, 2003). Hobby wood / furniture permits issued average about 10 to 12 per year. Although permits are required for the harvest of juniper from BLM land, there is evidence that these forest products are often collected illegally without permits.

Currently, most of the firewood collection from BLM land is administered through the Central Oregon Initiative Interagency Firewood Program that sells firewood permits for \$10 per cord. Up to eight cords are allowed per household annually (more than enough to meet most household's annual heating and cooking needs).

Based on the current price of a cord of wood (about \$110), firewood permits can provide up to \$800 $(\$110/\text{cord} - \$10/\text{per cord permit cost}) \times 8$ allowed cords) in value to each household in the region that uses firewood (although there is a personal labor cost for the cutting and hauling of the wood). In addition to the economic benefits to households, sales of chainsaws and other woodcutting equipment and supplies plays some part in the local retail and service economy.

From 1992 to 2002, firewood collectors gathered about 13,000 cords of wood from BLM managed lands in the Planning Area, generating \$130,000 in revenue for the federal government and about \$1,300,000 of economic benefit to permit purchasers (although there were personal labor and equipment costs for the cutting and hauling of the wood and firewood costs have not always been \$110 per cord).

Despite the population growth experienced in the Planning Area over this same time period, local public demand for firewood seems to be stable or slightly declining. This trend may be due to local government code restrictions on the use and installation of wood burning stoves and increased use of other heating systems in new homes.

Military

Military use of BLM managed lands in the Planning Area occurs on about 31,000 acres under all alternatives. Use of this land consists primarily of training exercises at the BIAK Training Center. The BIAK Training Center is presently classified as a Local Training Center, and as such, depends on funding and resources from another training center. The BIAK Training Center cannot qualify for direct congressional funding unless it is upgraded from a Local to an Intermediate Training Center. Upgrading requires a long-term land use agreement of at least 30 years (McCaffrey, personal communication, 2003). In 2002, the amount of spending in support of Oregon training totaled about \$1,000,000 (McCaffrey, personal communication, 2003).

Amenity values

Amenity values typically mean those natural and physical characteristics of an area that contribute to people's enjoyment and appreciation of an area and /or that contribute to its appeal, aesthetic coherence, and cultural and recreational attributes. For example, a species or scenic vista has an amenity value if its existence improves our lives in some nonmaterial way, e.g., when we experience joy at sighting a hummingbird or when we enjoy walks in the forest more when we sight a lady-slipper. Hiking, fishing, hunting, bird-watching, and other pursuits for which the planning area is used have a market value as recreation, and wild species and scenic vistas contribute, as amenities, to these activities. Yet, expressing amenity values remains somewhat elusive. When dealing with an abstract concept such as amenity values in the context of assessing any change or shift in land use management, it is important to establish precisely what we mean when we refer to the planning area's amenity values. The issue categories that most closely reflect the potential for effects to amenity values are Recreation, Visual Resources, and Land Ownership.

The concept of amenity value is inherently tied to what economists call “non-use values” as well as direct use values associated with natural resources. The premise is that people place monetary values on natural resources that are independent of their present use of those resources. For example, some people may gain utility simply from knowing that the Boundary Waters Canoe Area (BWCA) is preserved even though they may never expect to visit the BWCA. Similarly, people may be willing to pay to ensure the survival of salmon, humpback whales, lynx, and marbled murrelets even though they may never expect to see one of them. Lying behind this thesis is the assumption that there is a meaningful way to define use so that values arising from use can be distinguished or separated from those that are independent of use. When discussing socioeconomic impacts, it is important to go beyond simply delineating the more or less tangible changes and link these to human values.

In the economics literature, natural resource values that are free of people’s present use of the resource have been variously termed intrinsic, existence, and nonuse values. These values arise from a diversity of motivations, including, stewardship responsibility, desire to preserve for potential future use, and a desire to bequeath certain environmental attributes and resources to future generations. Today, it is widely accepted that these nonuse values in aggregate can be very important.

Estimates of the value that local residents and users place on BLM lands for amenity purposes have not been specifically quantified. Estimates of value have been derived from previous studies and surveys and trends analysis for the region. For example, we know from this work that most people today value the openness and “naturalness” offered by large areas of undeveloped lands. Local realtors attest that proximity and access to BLM lands is desired by many land buyers (Korish, personal communication, 2003), generally for their scenic, recreational, or undeveloped natural land qualities, and suggest that maintenance or enhancement of these qualities would have a positive quality of life impact on local residents or users. The extent of amenity migration is another indicator which can be directly associated with people’s desire for proximity to areas with high level of amenities. Several studies conducted across the U.S. have shown conclusively that rural areas are most likely to experience growth in the 1990s, as is true of the Planning Area, (McGranahan, 1999). One of the key forces behind this growth in high amenity areas has been the growth of retirement and recreation areas in rural America. The aging of the population has increased the number of people of retirement age who are now searching for places to live that have low crime rates, low costs of living, and moderate winters. The resulting growth in transfer payments to rural areas has helped to create new jobs (Hirschl and Summers, 1982; 1984).

An additional feature contributing to the growth in high amenity areas, however, was the economic expansion of the 1990s. Demand for amenities is strongly related to income. As the population becomes wealthier, they are more able to take advantage of the benefits offered in high amenity areas. One example of this income effect is the growth of seasonal homes in various regions of the U.S. (Marcouiller *et al.*, 1996). As disposable income increased during the 1980s and 1990s, second homes proliferated. Similarly, many people had more resources for outdoor recreation and for early retirement, which fueled the process of the growth of amenity areas.

This analysis considers public open space provided by the numbers of acres and zoning designations considered in Land Ownership and the range of recreational opportunities provided by the recreation management emphases established by the RMP alternatives. In assessing amenity values, management practices proposed by the RMP that could change the appearance of the natural landscape were qualitatively considered, such as vegetation, fire / fuels, and mineral extraction management.

Indirect socioeconomic impacts are typically those that can be seen on employment, household income, etc. generated by the change in the demand for goods and services

required by the directly affected industries. Indirect impacts are closely related to induced economic effects which are generated by changes in consumer spending resulting from changes made to certain factors, amenity values in this instance. Although BLM lands are a contributor to the attractiveness of the Planning Area, using data currently available, it is not possible to determine exact visitor expenditure capture rates or direct expenditures, to attribute a percentage of any additional spending values to the values provided by BLM- administered lands, or to reflect measures of indirect impacts of the Resource Management Plan alternatives. .

Recreation and tourism

On average, people have less leisure time than in the past, although that does not necessarily reflect trends in areas with a high component of retirees. Trends reflect that having less time has influenced the nature of recreational use. Individuals and families are going to the parks and other public lands that are close to them with greater frequency, but with shorter duration than in the past (Oregon Parks and Recreation Department, 2003). This, taken against regional recreation trends and growth of outdoor recreation across the socioeconomic spectrum indicates that visitor recreation and demand on BLM managed lands in the Planning Area is likely to continue to increase, given regional, state, and national trends in outdoor recreation (Community Planning Workshop, 2002; Oregon Parks and Recreation Department, 2003; U.S. Department of the Interior, 2002).

To the extent possible, actual data collected during patrols of the various designated OHV recreational areas was used to derive a clear understanding of visitor use and shifting trends for both non-motorized and motorized recreational use of BLM lands. Where data specific to the planning area was not available, general trends analysis was conducted using exiting regional, state, and national information.

In Central Oregon, tourism and recreation serve as important income generators. For example, the 2001 National report (U.S. Department of the Interior, 2002), shows that participants 16 years old and older spent \$769 million on wildlife-watching activities in Oregon in 2001, fishermen another \$602 million, and hunters some \$365 million, representing a combined total contribution of about \$1.74 billion to the State's economy. While no precise figures exist for the planning area, it is clear that these activities are important within the regional context.

The area's magnificent scenery, clean environment and numerous, as well as varied, recreation locations makes the region a popular vacation destination. However, while tourism and recreation have this important regional role, the BLM lands within the Planning Area do not serve as primary tourist destinations. According to tourism personnel interviewed at the Central Oregon Visitor's Center and the Bend Visitor's Center, other recreational and tourism opportunities such as the mountains and forests in western Deschutes County serve as principal regional visitor attractions (Audette, 2003; French, 2003; Ives, 2003). The one exception to this general statement about BLM lands in the Planning Area is wintertime OHV recreation. This use of the planning area contributes substantially to the local tourism seasonal economy.

Aside from the designated and advertised OHV trail systems, currently few visitors are knowledgeable about the recreational resources within the BLM Planning Area. However, its considerable scenic and open space resources add to the region's naturalistic character. In addition, the BLM lands increase regional tourism and recreational capacity by providing recreational opportunities for local residents who would otherwise compete for use of other more popular regional recreation areas.

Recreation trends suggest that individuals participate in a range of non-motorized and motorized recreational activities in the area. The most popular activities are recreational activities such as hiking and walking, biking, nature and wildlife observation, off-road

motorized use (OHV), hunting and target shooting, camping, and horseback riding. (Community Planning Workshop, 2002 and Oregon Parks and Recreation Department, 2003). There has been a significant increase in public demand for nature study activities and for land management emphases on wildlife and natural resource protection as well as for amenities including quiet, natural places (Oregon Parks and Recreation Department, 2003). Demand for OHV use in the region has increased over the past decade (Oregon Parks and Recreation Department, 2003). Use of BLM lands to provide winter recreation opportunities, particularly for motorized recreation, when U.S. Forest Service lands are inaccessible will continue and become more prevalent. National and statewide trends reflect potential increased mountain biking use in the area (Sporting Goods Manufacturing Association, 2001). Demand for community recreation facilities (group use sites, sports fields, etc.) will also continue to increase over the length of the plan implementation period.

Based on information derived from the Social Values Survey, there is a need for greater separation between motorized and non-motorized user groups on BLM managed lands in the Planning Area.

Land Ownership

The direct effect of land ownership classifications (Z1, Z2, Z3, or Community Expansion) is to influence or direct future BLM land management decisions, while the indirect effects relate to the amount of open, undeveloped space that would contribute to amenity values, or the amount of land available to meet future community needs. Any future transfers of BLM lands would necessarily be contingent on numerous other factors and participants for completion (e.g. other willing participants in the transaction, adequate funding and successful site-specific environmental compliance).

Designation of lands as Z-1 has the most restrictive influence on future BLM management decisions since these lands are identified for retention, while Z-3 designations have the least restrictive influence, since these lands are classified for disposal through either sale or exchange. For community members, Z-1 designations provide the greatest assurance of specific parcels being maintained in public ownership. Lands classified as Z-2 provide moderate management flexibility since these lands may be exchanged if there are equal or better resource values to be gained. This classification assures that lands would only be exchanged of equal or greater value, but that may not provide for specific parcels to be maintained in public ownership. Designation of Community Expansion lands are a subset of Z-3 designations, but restrict disposal to local governments, which puts a strong limitation on future management flexibility, but provides communities with a strong assurance that lands would not be used for purposes inconsistent with the community needs.

The past incidence of BLM land transfers has been very limited. Local agency funding constraints have been, and are likely to remain, a major obstacle to future land transfers of BLM within the Planning Area. At the past rate of interagency transfers within the Planning Area, the land ownership of very few acres of BLM lands would be expected to change ownership in the near future. However, current and near future demand by communities or agency initiatives may affect past rates of sale or exchange.

Transportation

User-created travelways

Much of the current use of user created travel-ways within the Planning Area is by recreational users that currently have few if any alternative resources. If alternative recreational opportunities (such as designated trail systems) are developed, many of the current recreational users would likely shift their uses accordingly.

Road Maintenance

To analyze BLM’s potential future road management costs under all proposed RMP alternatives, cost information was obtained from recent road condition surveys performed by the U.S. Forest Service for the neighboring Deschutes and Ochoco National Forests. The Forest Service classifies its road inventory according to maintenance level standards. These standards vary from Level 1 roads (intermittent service that are closed to vehicle traffic and require very little maintenance) to Level 5 roads that are designed and maintained for all types of traffic.

Based on comparisons between the existing BLM and U.S. Forest Service road inventories and maintenance standards, BLM’s local road maintenance costs would be most comparable to Forest Service Level 2 costs and collector road maintenance costs would be comparable to Forest Service Level 3 costs. Due to lower rainfall, less-steep topography and fewer adjacent trees on BLM lands, the annual road maintenance costs for most BLM lands would be substantially lower than the U.S. Forest Service estimates.

Table 4-26 presents the estimated future annual maintenance costs for BLM roadways and also shows the equivalent U.S. Forest Service maintenance levels and costs. These cost estimates also represent the full annual maintenance costs, but in practice, the BLM, Forest Service and other agencies regularly defer annual maintenance spending.

Incomplete and Unavailable Information

This analysis focuses primarily on qualitative discussions of the alternatives rather than on quantitative comparisons and evaluation. In general, quantitatively evaluating programmatic plans such as the RMP present far greater challenges than quantitatively analyzing project-specific actions, since programmatic actions are inherently more general and unspecified than site-specific projects. Thus, in most cases the relative importance or significance of findings is difficult to predict, and should not be considered conclusive without more specific information about future implementation. Without a more complete quantitative economic analysis the available secondary data only informs our understanding of potential impacts based on general trends within the region, state, and nation.

Analysis of the Alternatives

Common to All Alternatives

The effects described in this section are derived from existing and projected socio-economic conditions that are unchanged by the decisions made for the planning area, but that influence the significance of effects

Table 4 - 26. Comparison of estimated annual road maintenance costs

USFS Maintenance Level	Estimated Annual Cost per mile for USFS roads	BLM Road Type	Estimated Annual Cost per mile for BLM roads
2	up to \$1,650	Local	\$900 - \$1,000
3	\$5,200 - \$6,400	Collector	\$2,000 - \$2,400

Note: These annual cost estimates represent the projected funding necessary to maintain agency roads adequately so as not to generate additional deferred maintenance needs. Actual annual maintenance spending has been less than these estimated costs

Source: U.S. Forest Service and BLM District Offices (Paterno, 2002 and 2003; Collins, 2002, personal communications).

Ecosystem Health and Diversity

BLM spends approximately \$1.5 million per year on its fire suppression program, not including large fire suppression costs, which are paid from other accounts. Fuels management programs are funded at about \$2.4 million annually, including planning and salary costs, district support costs, and treatments including a mixture of prescribed burning and mechanical fuels reduction treatments. The fuels program is growing dramatically with the emphasis placed on reduction of hazardous fuels by the 2000 National Fire Plan.

Livestock grazing and firewood collection on agency lands also serve to reduce fuel loads, although the value of these activities to the fire and fuel management programs has not been quantified. Often there is a cost associated with administration or clean up following wood cutting, and the costs and benefits may actually cancel one another out, resulting in a break-even situation. These costs express the entire program costs over 1.6 million acres of BLM lands in Central Oregon, a much larger area than the BLM managed lands in the Planning Area.

BLM fire and fuels management programs play an important role in maintaining public safety and protecting property and ecosystem values within the region. Throughout the Planning Area, BLM lands are adjacent to local communities and private residences. As a result, wildland fires have a great potential to cross property lines between private lands and wild lands. Wildland fires risk public and firefighter safety, have the potential for property damage and ecological effects that may not be consistent with management objectives.

As part of its land stewardship responsibilities, BLM manages fuel arrangement and quantities as a preventive measure to reduce the severity of wildland fires. Also, BLM actively suppresses wildland fires to minimize fire damage to human lives and property. The Federal Fire Policy of 1995 stresses that human life is the primary priority for protection. As a secondary concern, BLM also uses fire management to minimize resource damage from wildland fires.

Land Uses***Livestock Grazing***

Under all alternatives, livestock grazing would continue to be allowed in the planning area, with authorized use expected to be at least 72 percent of current authorized use, or at least 50 percent of Alternative 1 direction.

Mineral Uses

- **Locatable and Leasables**
These are not discussed in detail in this section, as there is low potential for the development of these materials.
- **Salable Minerals**
All alternatives make decisions about availability of lands for mineral uses and conditions under which those uses may occur, but do not authorize site-specific development. In all alternatives, there would be a minimum of about 300,000 acres available for mineral uses. The primary variables are related to specific site information such as rock quantity and quality and haul distance, which are generally not known at this scale. Use of BLM lands for future aggregate sources offer two primary benefits for ODOT. Fees for development and extraction from these sites are generally waived for ODOT and other public agencies. For commercial operators, BLM would charge \$0.65 per yard of material extracted from public lands. By waiving this charge, BLM would, in effect, be transferring an equivalent economic value to the region from the cost savings. This savings may either be retained in the region

(e.g. by enabling ODOT to perform more work within the region for the same budget) or the savings could pass out of the region to benefit other areas of the state. As a conservative estimate (assuming that any cost savings are split equally between the region and state) based on ODOT's projected annual need of 135,000 cubic yards, the total potential cost savings would be nearly \$88,000 a year resulting in a regional savings of about \$44,000. In addition, ODOT estimates that the agency also is able to achieve major savings in its raw material costs when it can offer a material source for its aggregate needs. As its economic analysis of the aggregate industry for the Bend/Sisters/Redmond area concludes:

(T)he predominance of high quality aggregate material sources are owned by a few private owners, which reduces competition on construction contracts, and increases overall construction costs. Developing and/or acquiring new material sources in the study area under public control would be in the public interest, as it would increase the competitiveness of aggregate pricing and decrease overall road construction costs (ODOT, 1998).

ODOT also estimated that in 1998 it saved an average of \$4.40/ton of aggregate when it was able to provide a material source for a road project largely as a result of the increased competition for the contract. Adjusting for inflation and converting into cubic yards, this savings is estimated to correspond to about \$3.80/cubic yard. This would represent a total potential cost savings of nearly \$513,000 per year, resulting in possible regional savings of \$206,000 in addition to the savings from the waived lease costs.

A second economic benefit to ODOT from using BLM mineral resources would be generated from the hauling cost savings if nearby gravel sources can be used for future road improvements. ODOT considers the availability of local aggregate sources important since the cost of aggregate typically represents over 50 percent of roadway construction costs. Hauling costs directly affect the price of aggregate – each five miles of hauling distance can add between \$0.25 and \$1.00 per cubic yard of material. Since the location of the future BLM aggregate sources are not known it is not possible to precisely estimate the average hauling distance that BLM pits would provide ODOT compared with the existing private sources. However, the potential aggregate pits near Cline Buttes offer a 5- to 10-mile haulage savings compared with the next alternative private resources. Based on ODOT's projected annual need of 135,000 cubic yards, an increase in the average haul distance of 7.5 miles would increase raw material costs \$337,500 to \$1.35 million per year. Using the mid-point of the hauling cost estimate, then \$840,000 a year is a representative estimate of what the hauling cost saving might be if BLM sources are used by ODOT for its future aggregate needs.

Based on the analysis and assumptions stated above, the total economic savings is estimated to be about \$1.33 million a year, which (if the cost savings are shared evenly between the state and region) would result in a cost savings of about \$665,000 per year in the region. This would represent a direct positive impact to the region's economy. Note, however, these cost savings are only rough estimates, since the exact nature of cost savings and exact costs for site development and closure (siting, environmental compliance and other development and closure costs) are unknown.

Forest Products

There would be no change to the amount of lands designated commercial forest lands under any alternatives, and therefore no change to long-term projected economic benefits that could be realized from harvest of materials from those lands. There would be no changes to the current permit process for juniper or other special forest products harvest. Since none of the alternatives propose any major change to the current permit process for juniper boughs or other special forest and range product harvesting on BLM and the available resource supply is expected to be adequate for these continued land uses,

there would be no direct or indirect socioeconomic impacts as projected from future implementation of the RMP alternatives for juniper and other forest product harvesting within the Planning Area.

No changes to the current firewood permitting process are proposed under any of the RMP alternatives. Although BLM may periodically change the areas where firewood collection would be allowed, the alternative locations would not appreciably increase the cost or decrease the opportunities to gather firewood on BLM managed lands in the Planning Area. Firewood collection from dead trees would be expected to decline while firewood from small diameter green trees (thinning) would be expected to increase. Future firewood sales are projected to be below the Planning Area's sustainable yield.

Since none of the action alternatives proposed to change the current permit process for subsistence or other firewood collection on BLM lands and the available resource supply is expected to be adequate for these continued land uses, no change in socioeconomic effects are projected as a result of future implementation of the RMP alternatives.

Military Use

Common to all alternatives would be the designation of some portion of the planning area under a long-term use agreement that would enable the OMD to qualify for a training center upgrade and direct congressional funding, thus maintaining a reasonable expectation of annual revenue into the local communities similar to that experienced during 2002.

Amenity Values

Scenic values on BLM managed lands in the Planning Area would continue to be characterized by the large tracts of natural lands in the region, with dominant vegetation features including juniper and pine wooded areas, shrub lands, and grass lands. Topography and water features are other dominant natural landscape features. Wildland fires would continue to be suppressed, limiting short-term adverse visual impacts associated with burned landscapes.

Recreation and Tourism

Visitor spending associated with recreation activities on BLM lands within the Planning Area will continue to provide economic contributions to the local and regional economy. However, based on secondary data at hand it is not possible to measure the effects of directly associated visitor spending relative to BLM managed lands in the Planning Area. It is expected that given the concentration of OHV use occurring between the months of December through March that economic inputs relative to all recreational uses will be greatest during these periods. Other seasonal variations relating to recreational uses on BLM managed lands in the Planning Area can be expected; however, there is limited data to predict inputs relative to seasonal fluctuations.

Transportation

Road Maintenance: Arterial roads within the Planning Area are mostly under county or state jurisdiction and therefore not maintained by BLM. In 2002, BLM estimated its annual road maintenance budget for the Planning Area was about \$26,300 and staffed by the equivalent of 0.2 full time equivalents (Leonard, 2003) for roadway-related work. This budgeted level of annual road maintenance is insufficient to meet the annual road maintenance needs for the area, and results in continuing annual deferred maintenance in all alternatives.

User-created travelways: Blocking or obliterating user-created travel-ways is an on-going activity as new, undesignated travel-ways are found. The proliferation of user-created travel-ways damages vegetation, increases soil compaction, makes it harder to understand the designated road system, provide access to problem dumping areas, and

often provide convenient access from residential areas to public lands. Generally these roads have very intermittent uses and their elimination would likely have very limited impacts. Some local residents may have convenient access to public lands eliminated, although these past uses have generally not been in compliance with BLM authorized land use policies. It is also expected that reductions in user created roads, particularly in areas near to urban areas or residential areas would reduce the potential for illegal dumping noise, dust and user conflict with those residents preferring a naturalistic setting surrounding to their homes. Since past use levels and use patterns are not known, the extent and nature of these effects on local residents cannot be precisely identified or quantified.

Alternative 1

Specifically, this alternative is the Brothers/La Pine RMP direction continued with the addition of all subsequent NEPA decisions, emergency closures, settlement agreements and current memoranda. Alternative 1 would not provide a transportation corridor south of Redmond outside of the existing urban growth boundary, resulting in potentially reduced economic development for the City of Redmond. Lands classified for Community Expansion lands would include most of the lands in demand from local communities, but not in La Pine. Alternative 1 would anticipate a vegetation and fuels program that would generate about \$204,000 annually. All of the area would be open to mineral sales, which would give this the highest potential for conflict with adjacent neighbors of all alternatives. Amenity values would be represented by about 95 percent of the public lands within the planning area in a retention or retain or exchange classification and management flexibility would be the highest of the alternatives with about 44% of the planning area classified as Z-2. This alternative would also have the highest amount of lands designated for disposal, allowing for the greatest potential benefits from the BACA bill.

Community Needs

Under Alternative 1, about one percent of BLM managed lands in the Planning Area would be designated as Community Expansion areas, which are lands for disposition to other governmental ownership if these government agencies (federal, state or local) wish to acquire the properties. It is expected that the future use of at least part of the Community Expansion would include open space or recreational uses desirable to the local communities (such as group use sites, sports fields, campgrounds, recreational vehicle park facilities, target shooting areas, or other developed recreation amenities), but some future infrastructure development may also occur.

The Community Expansion areas identified under this alternative would be available for disposition to other governmental ownership if these government agencies (federal, state or local) wish to acquire the properties. It is expected that the future use of at least part of this 5,617 acres would include open space or recreational uses, but some future development may also occur.

Redmond: Under this alternative, up to 300 acres of BLM land adjoining the Deschutes County Fairgrounds would be available for possible acquisition by the County or other local agency to enable future Fairground expansion. Development of additional parking and open space recreational uses (such as development of a recreational vehicle park) are the expected future land uses for the acquired lands. This expansion of facilities would represent positive social and economic benefits to the local community and region by providing additional capacity and services to serve large events and attract visitors (Bishop, 2003). The large availability of land offered and the relatively slow rate of likely future development in the area suggests that 300 acres would be more than enough land to accommodate development within the next 20 years.

La Pine area: Under this alternative, several properties designated by the BLM as Zone 2 properties are desired by local communities (as described under assumptions) for

development. Since these properties would be designated as Zone 2, it is possible that some public entity could acquire these lands if there is evidence of sufficient community need (per the Recreation and Public Purposes Act) and a fair land exchange can be arranged.

Regional Transportation: Alternative 1 corresponds to ODOT's "No Build Analysis" in the "Yew Avenue to Deschutes Market Road Analysis" (ODOT, 2002b). Under this alternative, no BLM land would be provided to ODOT or Deschutes County for use in future transportation improvements of US 97.

US 97 is the primary north/south transportation corridor for Central Oregon, serving the rapidly growing communities of Redmond, Bend, Sunriver and La Pine. The highway also is used as a major truck route for the Western United States, providing shorter and more direct access for goods between California, the Willamette Valley, Central Oregon, eastern Washington and Northern Idaho.

Travel speeds average from 35 to 45 miles per hour (mph) for automobiles and 26 to 40 mph for trucks along the corridor. By 2016, the travel time from Madras (just north of the Planning Area) to the California-Oregon border is expected to increase from 4.4 hours to 5.8 hours, an increase of nearly 30 percent. Currently, 27 percent of the corridor is classified as moderate congestion and 5 percent is high congestion. If no improvements to the highway are made, the areas of high congestion are projected by ODOT to increase to 26 percent (ODOT, 1995).

According to the ODOT transportation analysis, the current volume to capacity ratio (v/c) for the 30th highest hour for five of the intersections associated with the Yew Street interchange are unacceptably high and do not meet state mobility standards (ODOT, 2002b). The 30th highest hour statistic is used by ODOT to represent the likely peak rush hour conditions that may be expected to occur. Traffic conditions are projected to deteriorate further by 2015 and 2025 – resulting in v/c ratios greater than 2.0 at nine local intersections. These mobility conditions can be expected to hinder further development in the neighboring areas. The congestion and delays associated with the inadequate traffic infrastructure may be expected to be a fundamental constraint to any new commercial, industrial or residential development on properties needing to use these connections to access US 97.

As a result, unless the Yew Street interchange and transportation system receive adequate improvements, it is expected that any development adding significant levels of traffic in that area would prove difficult to permit. This presents potential adverse consequences to the City of Redmond since this constraint could prevent:

- Planned future expansion of the current transportation system;
- Expansion of the County Fairgrounds; and
- Continued economic development at the existing Airport Business Campus Industrial Park (ABC Industrial Park) and future development of the planned Roberts Field Business Center (Roberts Center).

In addition, several other potential local development projects could be affected by continued "failure" of the Yew Street interchange. These include: planned expansion of the Central Oregon Community College, the planned Franks Landing commercial center at the Yew Avenue Interchange, the 200 acre Central Oregon Irrigation District office park development, and future development of 80 to 100 acres of City of Redmond property zoned for industrial use located south of Airport Avenue and west of 19th Street.

At this time, most of the projects mentioned above have insufficient information to assess economics associated with their development. However, the ABC Industrial Park and the Roberts Center have had studies done to assess potential changes to the region's

economy. If completed, the ABC Industrial Park and the Roberts Center together could add between 1,600 to 4,750 jobs and \$42 to \$179 million in wages to the region. Similarly, the development of those two projects could generation up to \$12 million in enhanced property value and taxable property base for the City and County. In addition, full construction of those two projects could generate one-time construction spending of over \$183 million for the region. Under Alternative 1, the region would not realize such benefits. It should be noted, however, that total economic development estimates presented for ABC Industrial Park and the Roberts Center are highly dependent on numerous other factors such as future commercial real estate demand, other economic conditions and related regional development. However, for purposes of this analysis these projections serve as a relative means of comparing alternatives.

Ecosystem Health and Diversity

Alternative 1 represents BLM's current fire/ fuels and vegetative management practices and operational budget. All other alternatives are then compared to Alternative 1 to determine potential changes under the proposed RMP alternatives. BLM provided no cost estimates for treatment planning activities (which would be mainly an internal-to-BLM expense). The following analysis is based on the cost of implementing the treatments. Current treatments on BLM managed lands in the Planning Area are estimated to be about 4733 acres annually. Of these 4733 acres, about 2580 acres are estimated to be prescribed fire treatment and about 2,000 are estimated to be mechanical treatment.

At an average cost of \$65 per acre, the cost for mechanical treatment of 2150 acres is estimated at \$139,750. At an average cost of \$25 per acre, the cost for prescribed fire treatment is estimated at \$64,500, for a total program cost of \$204,250 annually under Alternative 1.

Land Uses

Livestock Grazing

Alternative 1 is the baseline to which other alternatives are compared. Note that Alternative 1, the No Action Alternative, is not the same as the current situation.

Under Alternative 1, livestock grazing would continue on 388,823 acres, with 25,816 AUMs. No permittees would be affected by AUM reductions. In this alternative, BLM-administered forage would provide for just over four percent of local cow / calf sales.

Alternative 1 represents an estimated increase of 7,474 AUMs authorized use from the current situation, and a corresponding increase in livestock sales of 1.26 to 5.03 percent. Estimated sales of cattle and calves under Alternative 1 direction would increase by \$327,000 to \$1,308,549 from the current situation. This would increase the size of the livestock industry within the planning area, especially in the La Pine area where the unallotted areas are located.

Mining

Under Alternative 1, BLM has about 402,400 acres or 100 percent of BLM managed lands in the Planning Area open to locatable mineral entry. Similarly, BLM has about 372,850 acres or about 93 percent of BLM managed lands in the Planning Area open to mineral leasing, of which about 21,250 acres are barred from surface occupancy.

Alternative 1 would continue to have about 402,400 acres or 100 percent of BLM-administered lands in the planning area open to mineral sales.

IMPLAN Sector 51 – New Highways and Street multiplier has been used to estimate the potential for direct employment benefits to the region from the increased construction spending “funded” by the road construction raw material cost savings. The IMPLAN

employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates about 9.1 jobs. Therefore, an increase of \$665,000 in highway construction would generate about six jobs for the region annually.

The indirect socioeconomic effects associated with ODOT use of BLM mineral resources for its aggregate needs can be estimated using the IMPLAN input-output model. The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates about 8.5 indirect (and/or induced) jobs. Therefore, the estimated increase of \$665,000 in highway construction spending would generate about 5.6 indirect jobs for the region annually.

The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates \$0.6 million indirect (and/or induced) output spending. Therefore, the estimated increase of \$665,000 in highway construction spending would generate about \$0.4 million in indirect output for the region annually.

Forest Products

Under this alternative, the average annual timber harvest on BLM managed lands in the Planning Area would be about 50,000 cubic feet or 250,000 board feet. About half of this annual timber harvest would be for sawlogs, posts and poles, with an estimated sales value of about \$300 per 1,000 board feet. The remaining timber would be harvested for wood chips, with an estimated value of \$16 per green ton. The estimated commercial value of the harvestable sawlogs (not necessarily BLM revenue returning directly to BLM) would be \$37,500 and the wood chips would be about \$16,000 (1,000 tons). The total commercial value of timber production under this alternative would be about \$53,500.

Based on this production estimate, and assuming all revenue comes from salvage or restoration sales, the federal government would retain about 96 percent of this revenue (\$51,360) and the remaining four percent would be allocated to the state and likely returned to the county in which the timber was harvested.

Amenity Values

With respect to open space values, BLM would continue to classify about 95 percent of its lands within the Planning Area with the zoning designations Zone 1 and Zone 2. Under these zoning designations, BLM would continue to retain the lands in public ownership with an emphasis on increasing public land holdings (i.e., Zone 1) and would continue to identify these areas as lands with high resource values (i.e., Zone 2). Lands on the periphery of large blocks would continue to be fragmented and somewhat discontinuous on the periphery of BLM's holdings, which would somewhat detract from the open space values associated with natural space and opportunities for solitude.

Based on information derived from the Social Values Survey, there is a desire for greater separation between motorized and non-motorized user groups on BLM managed lands in the Planning Area. While opportunities for mixed uses would remain the same under Alternative 1, the character of the natural areas and the quality of the experience would continue to be affected and in some cases dominated by motorized uses, thus potentially adversely affecting desiring a more natural experience.

Under Alternative 1, the application of recreation management emphases (for definitions of recreation management emphases, see the following Recreation discussion) would continue to provide a range of recreation opportunities, although mostly shared use facilities. Nearly 80 percent of BLM lands in the Planning Area would be managed with a multiple use with shared facilities emphasis and nearly 20 percent would be managed with a roads only/low recreation emphasis, providing very little separation between motorized and non-motorized uses.

Due to these considerations, amenity values under Alternative 1 would continue to be beneficial contributors to the quality of life in the region, but are not optimized due to parcelization of open space and a limited range of segregated recreational opportunities.

Existing vegetation management practices would continue under Alternative 1, under current visual classifications. Alternative 1 provides less emphasis on the scenic importance of dominant community background features. However, to most people the difference in emphasis is not noticeable. About 402,400 acres within the Planning Area would be open to mineral sales, potentially resulting in adverse visual impacts associated with surface mining activities (e.g., large-scale vegetation clearing, topographic modifications, erosion, etc.), although the likelihood of wide-scale landscape disturbance is low. Overall scenic values under Alternative 1 would continue to have moderate beneficial effects on the quality of life in the region.

Under the Alternative 1, visitors would continue to be unaware of the recreational resources on BLM managed lands in the Planning Area, and recreational opportunities and amenities (e.g., designated trails systems, signage, parking lots, outhouses, and interpretive areas) would continue to be limited. The potential development of recreational amenities for local communities in Community Expansion areas would have a positive effect on visitor enjoyment of recreational resources in the planning area.

Transportation

Local Transportation System: Alternative 1 represents the amount of total road miles currently inventoried in the BLM data base. In total, there are about 3,281 miles (2,562 miles of local roads, 302 miles of collector roads, 199 miles of historic roads, and 218 miles of arterial roads) of roads that meet definitions of local, collector, or arterial roads as defined in the Glossary.

Common to Alternatives 2-7

Within the limits of available information, this social and economic analysis suggests that, because of the nature of the decisions, for most resource areas Alternatives 2-7 would have negligible adverse or beneficial effects on the region's social and economic environments. The exception to this would be the projected indirect economic benefits derived from restoration and fuels reduction activities, from projected economic development associated with the transportation corridor south of Redmond, and from the expected cost savings to ODOT from areas available for mineral extraction.

Alternatives 2-7 would provide some designated transportation corridor to help to meet identified community needs within the planning area. The potential future effect would be to allow for at least build-out within the City of Redmond's Urban Growth Boundary, although the degree to which the corridor would alleviate current problems varies by alternative.

For Alternatives 2-7, the combined total quantifiable spending and employment changes from timber and vegetative management changes would be less than a \$0.5 million and fewer than 12 jobs. Compared with a regional economy for the agricultural sector of \$143.7 million in annual output and 3,906 jobs, the projected changes in spending or employment for timber and vegetation management would be less than a 0.35 percent increase in the region's agricultural industry and 0.3 percent increase in regional agricultural jobs. In a regional context, therefore, this increase would be barely discernable and would be considered only of minor importance to the area's agricultural sector. The increase would have no discernable national importance.

Livestock grazing would continue on 228,685 to 388,271 acres, with 13,286 to 25,747 AUMs. One to fifty permittees would be affected by AUM reductions, and there would be a 0.01 to 8.44 percent reduction in local cow / calf sales.

The exact importance of the social and economic findings associated with mining and minerals cannot be stated without additional analysis. However, for saleable minerals, while the magnitude of the full cost savings loss is indeterminate, if the full savings of \$665,000 and six jobs were lost from the construction sector, this would represent an adverse impact, decreasing regional construction spending and jobs by about 0.06 percent. In the context of the Planning Area, its vicinity, and the region in general, this small decrease would likely have little significance on the local economy. This decrease would have no discernable national importance.

Under Alternatives 2-7, surface occupancy restrictions would increase under each action alternatives from about 52,810 acres under Alternative 2 to about 101,350 acres under Alternative 5. However, the potential for locatable or leasable mineral development is low, and it is unknown whether the location of the surface occupancy restrictions would affect any future mineral leasing activities.

Future reconfiguration of the transportation system on BLM managed lands within the planning area is intended to meet recreational and travel management objectives, maintain adequate user access, and reduce BLM's land management costs (e.g., by reducing route mileage, dumping opportunities and law enforcement requirements).

Alternatives 2-7 would all include direction for subsequent area analyses to determine whether local roads would become part of the designated system, or be available for closure. In general, future direction would likely be to close redundant roads and develop more loop routes in an effort to decrease user-created road formation and use. Although exact effects cannot be predicted until a site-specific analysis determines which local roads would be designated or closed, based on other management direction, those areas with primary or secondary wildlife emphasis are likely to have the greatest potential for road reduction. (See also Chapter 4 - Transportation and Utilities) Closure of frequently traveled local created roads may affect users who relied on these routes as access to specific locations for recreational or other activities within the Planning Area. Removal of these access routes would likely increase their travel time to the location if they can take alternate routes to access these locations.

No economic benefits to the local economy were identified due to the disparity between the current road maintenance expenditures and the projected cost for future maintenance and the uncertainty over the exact road miles to be maintained under each alternative. Given the current deferred road maintenance needs, it is difficult to determine the additional effects any changes in responsibilities would have — either for road closure or for road maintenance. Considering both context and intensity, the effects from internal road changes do not appear to be of major importance regionally or nationally. However, the internal road changes could have substantial importance to the local BLM district in determining budgets and establishing funding priorities. Road maintenance funds are not projected to increase, and therefore, a continuation of deferred annual maintenance would occur in Alternatives 2-7. In future, the anticipated reduced amount of local roads would also reduce the amount of deferred maintenance. However, until a final site-specific analysis has been completed, there is no way to estimate the degree to which that might be reduced.

Individual Alternatives

The effects of transportation corridors transportation and access impacts associated with the RMP alternatives on regional transportation vary. However, Alternatives 3 - 7 would provide for a transportation corridor allocation that could potentially provide for major transportation improvements to solve existing interchange problems. The potential related economic development that could be realized by the interchange improvements was estimated at \$42 to \$179 million in annual wages and 1,600 to 4,750 jobs. While such economic development is dependant on numerous other factors, even the lower level of job increase would result in nearly a 2 percent increase in regional

employment. This would represent a major economic benefit in the Planning Area, its vicinity, and regionally. Accordingly, the benefits associated with Alternatives 3 through 7 could have substantial regional importance and significance. Nationally, however, the transportation-related land use changes proposed under Alternatives 3 through 7 would have little importance.

These alternatives all have potential major socioeconomic benefits for the region from improvements to the regional transportation compared to the No Change Alternative. It is conservatively estimated that 1,600 jobs and \$42 million in additional wage income could be dependant on the development of a South Redmond — Deschutes Market interchange solution to the regional transportation problems at Yew Avenue. While this economic development will also be dependant on numerous other factors, the transportation corridor provided under these alternatives would be a key land resource necessary for the South Redmond — Deschutes Market interchange. Therefore, it is projected that these alternatives would have substantial potential direct and indirect socioeconomic benefits for the region from new jobs and spending generated by the potential economic development.

For Alternatives 2, 4, and 5, there would be an expected indirect effect resulting from future vegetation restoration and WUI treatments representing an estimated net increase in management spending of about \$107,500, which would generate about three jobs. An estimated \$68,800 in additional indirect spending and one job would be generated by these alternatives

For Alternatives 3, 6, and 7 there would be an expected indirect effect resulting from future vegetation restoration and WUI treatments representing an expected net increase in management spending of up to \$342,000, which would generate about nine jobs. An estimated \$218,880 of additional indirect spending and up to 3.3 jobs would be generated by these alternatives. This is a beneficial but small local economic impact.

The effects of the alternatives vary by the amount and location of acres available for mineral material sale (see Chapter 4 Land Uses – Minerals), and by the potential for cost savings to ODOT. This potential cost savings is likely to be realized under most of these alternatives. However, under Alternative 4, ODOT may not realize that cost savings due to requirements to use alternative existing aggregate sources before developing comparable sources on public lands. The added costs would represent “lost” cost savings to ODOT compared to the savings ODOT achieves under Alternative 1 and 2. The lost ODOT savings could have adverse indirect effects on jobs and spending in the region, although how that might be offset by jobs and spending by private companies has not been examined in detail. For Alternatives 3, 6, and 7 the estimated cost savings would likely be realized, but could be somewhat reduced compared to that in Alternative 2 because of some potential additional development or operational costs related to SMA restrictions.

For Alternatives 2, 4, and 5, about \$75,000 in increased timber production would occur compared to Alternative 1, which would generate about 2 jobs for the region. This represents a small but beneficial impact. No socioeconomic impacts are expected since adequate resources are expected to be available and no changes to the permit process are proposed. An estimated \$48,000 of additional indirect spending and up to one job would be generated under each alternative. This represents a small but positive local economic benefit. For Alternatives 3, 6, and 7 increased projected timber production that would occur under these alternatives would generate two to three more jobs for the region and about \$107,000 in spending. While these increases in employment and spending are not large, it is beneficial to the region. About \$68,000 of additional indirect spending and up to one job would be generated by these Alternatives.

There is little difference between the alternatives regarding open space. Alternatives 2-7 all include most of the planning area in a “retention” classification (Z-1 or Z-2). Alternatives 3, 4, 5 and 6 all have requirements for maintenance of open space characteristics on lands classified for Community Expansion. There would be substantial positive socioeconomic effects from maintaining large blocks of land with known resource values and preserving the greenbelts separating the Bend and Redmond communities. However, there may also be potential lost economic opportunities if those lands do not meet community needs for industrial or other identified development needs.

The potential effects that could reduce amenity values related to development of mining sites are discussed in the Land Uses – Minerals section of this chapter. Overall scenic values would be potentially most affected by these uses in Alternative 2, and would have the least potential to affect amenity values in Alternative 3. Alternatives 4 and 5 would also have reduced potential over Alternative 1 due to requirements for utilizing alternative sources and buffer zones around residential areas. Alternatives 3, 6, and 7 have the most aggressive probable vegetation treatments and can therefore be expected to have the greatest potential short-term effects on scenic quality, but would likely have similar long-term effects which would generally support continued naturalistic settings.

There are positive indirect socioeconomic impacts associated with these alternatives due to the perceived link between property values and proximity to open space and public lands. Recreational spending is expected to increase as a result of improved recreational opportunities. This is a beneficial local impact. These alternatives would have indirect benefits because they would increase the need for local goods and services to support more identifiable recreational opportunities and greater diversity than Alternative 1. Indirect benefits associated with these changes in recreational opportunities also would include increased opportunities for interpretation and education in the area.

Community Needs

Regional Transportation Corridors

Alternative 2: This alternative would allocate a transportation corridor to facilitate future granting of a right-of-way for a road south of Redmond to the Deschutes Market interchange. This alternative would not include a potential interchange link at Quarry Road.

ODOT’s analysis of this alternative concluded that this road configuration would not remove sufficient traffic from the Yew Avenue Interchange to enable the future interchange to meet mobility standards (ODOT, 2002b). While the proposed improvement of the interchange and extension of the roadway to the Deschutes Market interchange would reduce some of the congestion and traffic impacts at the Yew Interchange, ODOT indicates that these improvements would be inadequate to solve the congestion problems described under Alternative 1. Thus, this Alternative offers little change from Alternative 1. Under Alternative 2 none of the area’s potential economic development dependent on the Yew Avenue Interchange improvements would likely occur.

Thus, as in Alternative 1, the region would not realize the benefits associated with jobs, wages, enhanced property values, increased tax bases, or construction spending (see also Appendix A) Under this alternative, the estimated future economic benefits potentially associated with development of properties such as the ABC Industrial and Roberts Field Business Parks would possibly be partially obtained, thus representing some potential economic benefits; however, the degree to which future development would be limited under this alternative has not been quantified.

Alternative 3: Alternative 3 would allocate a transportation corridor to facilitate redevelopment of the Yew Avenue interchange and development of a roadway corridor about 2 miles south of Redmond to a proposed interchange at the junction of Quarry Road and US 97. The proposed roadway corridor would consist of an extension access between South Redmond and the two interchanges. Under this alternative, land use measures would also be applied to control any development on the land adjoining the roadway corridor to prevent any future sprawl impacts.

ODOT's analysis indicates that the proposed regional transportation and access changes under Alternative 3 would significantly improve the area's current and projected future traffic problems (ODOT, 2002b). Under this alternative, the 2025 volume to capacity (v/c) ratios for the segments of US 97 south of Yew Avenue and North of Quarry Road would be improved over the existing roadway — with v/c ratios decreasing by 0.04 to 0.06.

Under this alternative future economic development projects such as the ABC Industrial Park and the Roberts Center could be completed. If completed, the ABC Industrial Park and the Roberts Center together could add between 1,600 to 4,750 jobs and \$42 to \$179 million in wages to the region. Similarly, the development of those two projects could generate more than \$12 million in enhanced property value and taxable property base for the City and County. In addition, full construction of those two projects could generate one-time construction spending of up to \$183 million for the region. Under Alternative 3, assuming development of these projects or similar ones, the region would realize benefits that it would not realize under either Alternatives 1 or 2. Even if only some of the development associated with these projects occurred, the area would still realize substantial benefits to the regional economy. These economic benefits represent potential direct benefits to the economy.

Secondary benefits would be generated from the related spending in the regional economy by the employees and other businesses serving the firms in projects such as the industrial and business parks described above. The magnitude of these indirect impacts can be estimated using an IMPLAN input-output model for the affected region.

According to the IMPLAN model for the two county region, in the Trade sector about \$0.7 million of indirect spending is generated for every \$1 million of direct spending in the region. In addition, about 9.5 indirect jobs are also associated with every \$1 million of direct spending. Therefore, as a conservative estimate of the economic impact based on an estimated total direct economic development impact of \$42 million, about 400 associated jobs and \$29.4 million of indirect economic benefits could be expected.

Alternatives 4 – 7: Under all of these alternatives, BLM would provide a transportation corridor allocation to facilitate the redevelopment of the Yew Avenue interchange and development of a future roadway to both the Deschutes Market interchange and Quarry Road interchanges. The proposed roadway corridor would consist of an extension access between South Redmond and the two interchanges. Under this alternative, land use measures would also exist to control any development on the land adjoining the roadway corridor to prevent future sprawl along the corridor. The future transportation changes proposed for Alternatives 4, 5, 6, and 7 correspond with the ODOT's Alternative 3 as described in the *Yew Avenue to Deschutes Market Road Analysis* (ODOT, 2002b).

Under this alternative, traffic levels at the Yew Interchange would be reduced to acceptable levels by providing an additional transportation corridor for traffic between South Redmond and the Deschutes Market Junction. According to ODOT, future volume to capacity ratios south of the Yew interchange would be sufficiently improved under this alternative. In addition, under this alternative, the 2025 volume to capacity (v/c) ratios for most segments of US 97 south of Yew Avenue would be improved over the existing roadway — with v/c ratios decreasing by 0.01 to 0.06. Only at the segment of US 97 South

of 61st Street would this alternative worsen the volume to capacity ratio, and in that case the increases would be minor (only a 0.01 v/c increase northbound and 0.03 increase southbound). Under Alternatives 4 through 7, the region would realize the same direct and indirect economic benefits as those described under Alternative 3

Community Expansion lands

Alternative 2 would increase the acreage classified for community expansion compared to Alternative 1, which would facilitate transfer to state or local governments interested in acquiring these lands to meet their community needs.

Under this alternative, about 750 acres in the La Pine area would be classified as available for purchase by the Deschutes County and/or La Pine Special Sewer District for the purposes of sewage infrastructure expansion to serve future community and residential growth in the area. The new sewage facilities would enable the potential development of 1,800 homes in the area. In addition, about 300 – 400 acres near La Pine (currently identified as the site for potential future development of the La Pine Airport) and currently identified for expansion of 300 – 400 acres near Redmond (for the expansion of the County Fairgrounds) would be designated as Community Expansion lands. While all of these lands were also available for possible community use under Alternative 1, they could only have been obtained through land exchange agreements. Under this alternative, these lands have been identified as Community Expansion lands and, as such, can potentially be purchased from the BLM by appropriate agencies (and pending necessary compliance and agency approval), which may facilitate their future transfer.

While this economic development would be expected to have a positive effect on the local economy by providing more housing, infrastructure and other local development for the region, the social effects may differ on the local community and region. The expansion of the housing in La Pine could change the local social environment from the influx of new residents. However, any of these developments would also be possible under Alternative 1.

Alternative 3 would result in a net decrease of nearly 2,500 community expansion acres being available for disposition to other governments compared to Alternative 1. The reduced acreage available for potential community development would reduce the future options for state or local governments to meet their community needs since fewer BLM lands would be available for acquisition. Under this Alternative, there would be specific requirements that all of the 3,120 acres designated for community expansion be used for open spaces, greenbelts and parks. There would be lost economic development opportunities for the region since these lands would no longer be available to meet community expansion needs. The magnitude of the economic development impacts would be dependant upon the availability of alternative sites and opportunities to meet the community expansion needs. In addition to the possible loss of indirect economic development effects, the indirect social impacts associated with the airport and fairground expansion would also be “lost”.

Alternative 4 would classify lands for Community Expansion that could potentially accommodate sufficient lands for the La Pine Airport, the La Pine Sewage Treatment expansion and the 300 acres for the Deschutes County Fairgrounds would be available under the Community Expansion land allocation. Since the La Pine Airport development or La Pine Sewage Treatment expansion were identified as Z-2 lands under Alternative 1, their designation as Community Expansion lands under Alternative 4 represents potential positive social and economic impacts to the local area and region by facilitating their potential future transfer.

While it is anticipated that nearly all of the likely future Community Expansion lands would be maintained as open space (possibly with some increased recreation use), other land uses could occur if rezoning of the properties is completed by the appropriate

agencies. The only currently anticipated rezoning of Community Expansion lands would be associated with that the 40 acres needed for construction of the proposed La Pine Airport south facilities (Coffman Associates, 2002). Therefore, the current amenity values for these properties are expected to be maintained and no discernable adverse social environment impacts would be expected with the community expansion associated with this alternative. The condition that interconnecting open space would be an element of the future land planning under this alternative may be expected to add some unquantifiable positive indirect social effects and likely generate additional wildlife and other ecosystem benefits.

Alternative 5 would result in a net increase of about 159 acres in Community Expansion lands compared with the No Change Alternative becoming available for future transfer to county and/or city ownership if these government agencies wish to acquire the specific properties.

Under this alternative, BLM lands for both the La Pine Airport and La Pine Sewage Treatment expansion would not be available under the Community Expansion land allocation. The properties needed for these developments would be designated as Zone 1 lands and, therefore, would not be available for these uses. If no comparable and alternative land resources are available, then compared with Alternative 1 (which designated the properties as Zone 2 lands and potentially available to meet public needs), Alternative 5 would effectively preclude future development of the La Pine Airport and/or the La Pine Sewage System. This would likely represent some adverse indirect economic impact on the regional economy although the magnitude of the effect cannot be quantified. There would also be potential indirect social effects associated with these proposed developments that would also be “lost” from this precluded development on BLM lands in La Pine.

Under this alternative up to 300 acres of BLM would be available for future expansion of the Deschutes County Fairgrounds.

Alternative 6 would decrease lands classified as Community Expansion lands under this alternative by about 500 acres compared to Alternative 1, resulting in a net reduction of potentially “saleable” BLM lands (i.e. Z-3 and Community Expansion lands) of about 2,100 acres.

Under this alternative, BLM lands for the La Pine Airport, the La Pine Sewage Treatment expansion and the 300 acres for the Deschutes County Fairgrounds would be available under the Community Expansion land allocation. Since the La Pine Airport development or La Pine Sewage Treatment expansion were identified as Z-2 lands under Alternative 1, their designation as Community Expansion lands under Alternative 6 represents potential positive social and economic impacts to the local area and region by facilitating their potential future transfer.

Under this alternative, all of the likely future Community Expansion lands would be maintained as open space (possibly with some increased recreation use) and could be used only for parks, greenbelts, open space, recreational spaces or community infrastructure needs. Therefore, the current amenity values for these properties are expected to be maintained and no discernable adverse social environment impacts would be expected with the community expansion associated with this alternative. The condition that interconnecting open space would be an element of the future land planning under this alternative may be expected to add some unquantifiable positive indirect social effects and likely generate additional wildlife and other ecosystem benefits.

Two hundred (200) acres of BLM lands desired for the future expansion of the Deschutes County Fairgrounds would be designated as community expansion under

this alternative, as compared to 300 acres under Alternative 1. Facilitation of this development could result in indirect beneficial economy impacts to the regional economy.

Under Alternative 7, Community Expansion areas would decrease by 735 acres compared to Alternative 1. The potential development of recreational amenities for local communities on Community Expansion areas would have a negligible adverse effect on visitor enjoyment of recreational resources in the Planning Area compared to Alternative 1. Alternative 7 would not include requirements for open space or greenbelts, and would meet community needs for lands for future airport and industrial development as well as fairground expansion.

Ecosystem Health and Diversity

Under Alternatives 2, 4, and 5, BLM would increase the annual mechanical acres treated (from 2,150 acres under Alternative 1) to about 7,297 acres. At an average of \$65 per acre, this increase of 5,147 acres would increase program spending by about \$334,555 for mechanical treatment. Total prescribed fire treatment acres would increase slightly over Alternative 1 (from 2,580 acres to 3,924 acres), for an approximate increase of \$33,600 (1,344 acres X \$25/acre). Total overall vegetative management program costs would increase by about \$368,155 compared to Alternative 1.

Alternatives 2, 4 and 5 would result in a net increase of about \$368,155 in spending on vegetative management over current spending under Alternative 1. The IMPLAN Sector 26 – Agricultural, Forestry and Fishery Services most closely matches these treatment activities and therefore has been used to estimate the direct employment effects of the increased treatment spending. The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates 25.4 jobs. Therefore, an increase of \$368,155 in vegetative management would generate about 9.4 jobs for the region annually.

The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates 9.7 indirect (and/or induced) jobs. Therefore, an increase of \$368,155 in vegetation management spending would generate about 3.6 indirect jobs for the region annually.

The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates \$0.64 million in direct (and/or induced) output spending. Therefore, an estimated increase of \$368,155 in spending would generate about \$235,619 in indirect output for the region annually.

Under Alternatives 3, 6, and 7, BLM would increase the annual mechanical acres treated (from 2,000 acres under Alternative 1) to 5,581 acres. At an average of \$65 per acre, this increase in 3,581 acres would increase program spending by about \$232,765 for mechanical treatment. Total prescribed fire treatment acres would more than double over Alternative 1 (increasing from 4,000 to 8,371 acres), for an approximate increase in spending of \$109,275 (base on an average \$25 per acre cost). Total overall vegetative management program costs would increase by about \$342,040 compared to Alternative 1.

Alternatives 3, 6 and 7 would result in a net increase of about \$342,000 in spending on vegetative management over current spending under Alternative 1. The IMPLAN Sector 26 – Agricultural, Forestry and Fishery Services most closely matches these management treatment program activities and therefore has been used to estimate the direct employment effects of the increased treatment spending. The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates 25.4 jobs. Therefore, an increase of \$342,000 in vegetative management spending would generate about 8.7 jobs for the region annually.

The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates 9.7 indirect (and/or induced) jobs. Therefore, the estimated increase of \$342,000 in vegetative management spending would generate about 3.3 indirect jobs for the region annually. The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates \$0.64 million indirect (and/or induced) output spending. Therefore, the estimated increase of \$342,000 in vegetative management spending would generate about \$218,880 in indirect output for the region annually.

Land Uses

Livestock Grazing

In Alternative 2, livestock grazing would continue on 388,271 acres, with 25,747 AUMs. One permittee would be affected by AUM reductions. The effect on local livestock sales would be minimal, a 0.01 to 0.05 percent reduction, depending on permittee flexibility in securing alternate forage sources. An estimated \$3,000 to \$12,000 in livestock sales would be lost compared to Alternative 1. This reduction is minimal and is unlikely to have measurable effects on the local economy. In this alternative, BLM-administered forage would provide for just over four percent of local cow / calf sales.

In Alternative 3, livestock grazing would continue on 388,271 acres, with 25,747 AUMs. One permittee would be affected by AUM reductions. The effect on local livestock sales would be minimal, a 0.01 to 0.05 percent reduction, depending on permittee flexibility in securing alternate forage sources. An estimated \$3,000 to \$12,000 in livestock sales would be lost compared to Alternative 1. This reduction is minimal and is unlikely to have measurable effects on the local economy. In this alternative, BLM-administered forage would provide for just over four percent of local cow / calf sales.

In Alternative 4, livestock grazing would continue on 348,394 acres, with 23,471 AUMs. About 20 permittees would lose their BLM permits and need to find alternate forage, or reduce their herds. The effect on local livestock sales would be limited, a 0.039 to 1.58 percent reduction depending on permittee flexibility in securing alternate forage sources. An estimated \$108,000 to \$416,000 in livestock sales would be lost compared to Alternative 1. This reduction would impact the livestock industry but is likely to have minimal effects on the local economy. In this alternative, BLM-administered forage would provide for just less than four percent of local cow / calf sales.

In Alternative 5, livestock grazing would continue on 228,685 acres, with 13,286 AUMs. About 50 permittees would lose their BLM permits and need to find alternate forage, or reduce their herds. There would be a 2.11 to 8.44 percent reduction in local cow / calf sales, representing an estimated reduction of \$576,000 to \$2,221,000 in livestock compared to Alternative 1. This reduction would affect the livestock industry and is likely to have measurable effects on the local economy, though the induced impacts were not quantified. In this alternative, BLM-administered forage would provide for about 2 percent of local cow / calf sales.

In Alternative 6, livestock grazing would continue on 347,522 acres, with 24,308 AUMs. About eight permittees would lose their BLM permits and need to find alternate forage, or reduce their herds. The effect on local livestock sales would be minimal, a 0.25 to 1.02 percent reduction depending on permittee flexibility in securing alternate forage sources. An estimated \$69,000 to \$267,000 in livestock sales would be lost compared to Alternative 1. This reduction would impact the livestock industry but is likely to have minimal effects on the local economy. In this alternative, BLM-administered forage would provide for about four percent of local cow / calf sales.

In Alternative 7, livestock grazing would continue on at least 279,321 acres, with at least 21,310 AUMs. Only one permittee would be affected by mandatory AUM reductions.

The remaining AUM reductions would be accomplished through voluntary permit relinquishments.

The effect on local livestock sales would be minimal, a 0.76 to 3.04 percent reduction depending on permittee flexibility in securing alternate forage sources. An estimated \$207,000 to \$799,000 in livestock sales would be lost compared to Alternative 1. This reduction would impact the livestock industry and is likely to have measurable effects on the local economy, but these induced impacts were not quantified. In this alternative, BLM-administered forage would provide for 3.6 percent of local cow/calf sales. Creating RFAs would increase permittee flexibility to withstand short-term AUM reductions. Requiring voluntary relinquishment for most allotment closures means effects of AUM reductions on individual permittees would be more manageable, because the permittee can choose when (or if) to relinquish his/her permit.

Minerals

Of all action alternatives, Alternative 2 would result in the largest amount of acreage open to mineral sales with about 342,000 acres available to saleable mineral mining. This represents a reduction of about 15 percent compared to Alternative 1.

Alternative 2 offers the greatest potential for mineral sales with the least amount of restrictions of any of the action alternatives and therefore, the greatest likelihood the cost saving benefits for ODOT identified under Assumptions Common to 2-7 would continue to be obtained. Compared to Alternative 1, there would be no net change in the socioeconomic effects since it is expected that under this alternative the same cost saving benefits estimated for the region under Alternative 1 would still be obtainable under Alternative 2. This alternative offers the greatest likelihood that the indirect socioeconomic effects identified under Alternative 1 would continue to occur.

Alternatives 3 and 6 would have about 340,000 acres open to mineral sales, while Alternative 7 would have about 342,000 acres open to mineral sales. This represents a reduction of 16 percent in the available area compared to Alternative 1. While the areas open to mining under these alternatives are nearly the same as under Alternative 2, under these alternatives there could be additional operating requirements or restrictions on future mineral extraction if the sites are located within the Juniper Woodlands or Peck's Milkvetch ACEC. Alternative 7 would modify the boundary of the Peck's Milkvetch ACEC to exclude a potential mineral site, thus reducing the difficulty in potentially developing the site and increase the likelihood of cost savings for ODOT.

As discussed earlier due to the inherent nature of mineral material deposits, it is not possible to specify the location of the mining sites, and therefore, it is not possible to quantify precisely the economic savings that future mining within the Planning Area could provide ODOT. However, ODOT's preliminary analysis suggests that there are numerous potential sites and adequate reserves to satisfy ODOT's identified aggregate needs. Based on this, it is estimated that there is a good likelihood that these alternatives could generate the similar cost savings and economic benefits as those identified for Alternative 1. However, due to the additional requirements and restrictions on the development of new mineral material sites under Alternatives 3 and 6, there is a greater possibility that the cost savings would be reduced by increased extraction costs (e.g. from additional compliance requirements) or increased haulage distances (e.g. from use of more distant alternative sites with lesser conflicting resource values).

Based on the analysis and assumptions discussed for Alternative 1, the total economic savings that could be gained under Alternatives 3, 6, and 7 is estimated to be about \$1.33 million a year. If the cost savings are shared evenly between the state and region this would result in a cost savings of about \$665,000 per year for the region, in which case the cost saving achieved by ODOT would be the same as those it could achieve under Alternative 1. This would result in no economic effects associated with these alternatives.

However, if ODOT incurs additional mining or haulage costs under these alternatives, (e.g. from additional mining or post extraction land restoration requirements associated with ACECs or other resource issues), there would be a potential to have a reduced cost savings benefit. Moreover, there would be indirect adverse economic effects on the region from cost cost savings benefits.

Alternative 4 would have about 327,170 acres open to mineral sales. This represents a reduction of about 75,200 acres or about 19 percent when compared to Alternative 1.

Alternative 4, unlike any of the other proposed alternatives, would require ODOT to use alternative aggregate sources first, before opening a new public land source, if alternative sources exist within 30 miles of a construction site. Because of this requirement, Alternative 4 would encourage use of private sources more than other proposed RMP alternatives. Alternative 4, therefore, would likely result in no cost savings for ODOT since it may very well decrease the amount of aggregate obtained from BLM compared with Alternative 1. Although the lack of available information on the location of specific BLM reserves makes it difficult to precisely determine the extent of the lost cost saving under this alternative, if ODOT is required to rely on private sources for most of its future aggregate mining needs, the adverse economic impacts to the region's economy would be up to \$665,000 in lost cost savings and an associated six jobs that would have been generated by alternate use of the saved spending.

The indirect socioeconomic impacts for this alternative would follow directly from the direct socioeconomic impacts identified above. Compared with Alternative 1, it is expected that under Alternative 4 there would likely be no cost savings for ODOT from mining on BLM lands. The indirect economic impact from the "lost" savings would result in a loss of about 5.6 indirect jobs for the region annually that would have been generated by the region's economy from the lost cost savings. Similarly, it is also estimated that the loss of \$665,000 in saving would result in about \$0.4 million in lost indirect output for the region annually.

Under Alternatives 3, 6, and 7, BLM would have about 338,478 acres open to mineral sales. This represents a reduction of nearly 64,000 acres or about 16 percent in the available compared to Alternative 1. While the areas open to mining under these alternatives are the same as under Alternative 2, under these alternatives there could be additional operating requirements or restrictions on future mineral extraction if the sites are located within the Juniper Woodlands ACEC or Peck's Milkvetch.

Alternative 5 would open the least amount of acreage to mineral sales and would have about 304,700 acres open to mineral sales. This represents a reduction of about 25 percent when compared to Alternative 1.

Because of the reduced acreage available for mineral sales and the fairly high amount of acreage with restrictions, Alternative 5 would likely have few benefits to ODOT, given that agency's needs for aggregate and the costs associated with hauling. The extent to which these restrictions would reduce the potential cost savings to ODOT from use of BLM mining sites cannot be specified or quantified due to the uncertain nature of the reserve locations. However, under Alternative 5, mining restrictions are very similar to Alternative 2 except that the buffer zone limiting mining activities would be increased from one-eighth of a mile (Alternative 2) to one-half mile from residential development.

It is possible that the full cost savings of about \$665,000 per year for the region could be achieved under this Alternative, in which case the cost saving achieve by ODOT would be the same as those it could achieve under Alternative 1. This would result in no economic impact associated with these alternatives. However, if ODOT incurs

additional mining or haulage costs under this alternative (e.g. from additional mining or land improvement procedures associated with ACECs or other resource issues), it would represent an adverse economic impact to the region from “lost” cost savings benefits.

This alternative has an increased potential for use requirements or restrictions that could result in decreased cost savings for ODOT and the region compared to the No Change Alternative. If in fact, the cost saving achievable by ODOT under this alternative would be the same as those it could achieve under Alternative 1, this would result in no economic impact. However, if ODOT incurs additional mining or haulage costs under this alternative (e.g. from additional mining or land improvement procedures associated with ACECs or other resource issues), it would result in indirect adverse economic impact to the region from “lost” cost savings benefits.

Forest Products

Alternatives 2, 4, and 5 would provide an estimated average annual timber harvest of about 120,000 cubic feet or 600,000 board feet (half as saw wood and half as chips).

The estimated commercial value of the harvestable saw wood would be about \$90,000, depending upon demand and the estimated wood chip production would be 2,400 tons with a commercial value of about \$38,400. The estimated total value of timber production under these alternatives would be \$128,400 (\$123,256 of which would be retained by the BLM and \$5135 returned to the county of harvest if all sales were salvage or restoration). Compared to Alternative 1, these alternatives would generate an additional \$75,000 of revenue in timber sales.

The IMPLAN Sector 26 – Agricultural, Forestry and Fishery Services most closely matches the timber harvesting activities and therefore has been used to estimate the direct employment effects of timber harvest. The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates 25.4 jobs. Therefore, the estimated increase of \$75,000 in timber harvest revenues would generate about 2 jobs for the region annually.

The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates 9.7 indirect (and /or induced) jobs. Therefore, the estimated increase of \$75,000 in timber harvesting would generate about 0.75 indirect jobs for the region annually.

The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates \$0.64 million indirect (and /or induced) output spending. Therefore, the estimated increase of \$75,000 in timber harvesting would generate about \$48,000 in indirect output for the region annually.

Alternatives 3, 6, and 7 would project an average annual timber harvest on BLM managed lands in the Planning Area at 150,000 cubic feet or about 750,000 board feet (half as saw wood and half as chips). The estimated commercial value of the harvested saw wood would be about \$112,500 and the wood chip would be about \$48,000 (3,000 tons). The total commercial value of the timber production under these alternatives would be about \$160,500 (\$154,080 of which would be retained by BLM and \$6,420 would be distributed to the county of harvest if all of these sales were salvage or restoration sales). Compared to Alternative 1, these alternatives would generate nearly \$107,000 of additional annual revenue in timber sales.

The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates 25.4 jobs. Therefore, the estimated increase of \$107,000 in timber revenues would generate about 2.7 jobs for the region annually.

The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates 9.7 indirect (and/or induced) jobs. Therefore, it is estimated that an increase of \$107,000 in timber harvest spending would generate about one indirect job for the region annually.

The IMPLAN employment multipliers estimate that each \$1 million of spending (in 2000 dollars) in this sector typically generates \$0.64 million indirect (and/or induced) output spending. Therefore, it is estimated that an increase of \$107,000 in timber harvest spending would generate about \$68,000 in indirect output for the region annually.

Amenity Values

Under Alternatives 2 – 7 would all classify between 95 – 98 percent of lands in a Z-1 or Z-2 classification. The alternatives all emphasize retaining public lands to maintain or create large consolidated blocks of public open space with regional connectivity for improved quality of the recreational experience, including promotion of open space values associated with connected natural landscapes and opportunities for solitude.

Under Alternatives 2 and 4, the application of recreation management emphases would somewhat increase the range of recreational opportunities compared to Alternative 1. The majority of BLM lands (59 to 77 percent depending upon the alternative) would be managed with a multiple use with shared facilities emphasis. The remaining lands would be managed with an emphasis on non-motorized use and a small portion of the Planning Area would be managed as exclusive non-motorized use management or with a roads only low recreation emphasis. Open space values are marginally improved due to the increased range of recreational opportunities provided under the recreation management emphases.

Under Alternatives 2 and 4, areas open to mineral sales would be reduced by about 62,000 to 75,000 acres compared to Alternative 1, thus reducing the potential adverse visual impacts associated with surface mining activities.

Open space values are improved by an emphasis on maintaining and/or creating large consolidated blocks of open space. It is expected that some increases in amenity values based on an improved range of recreation opportunities would occur. Scenic values would be improved due to the localized vegetation restoration efforts, management and clean up of dump sites, and reductions in areas open to mineral sales. These represent beneficial effects associated with these alternatives. There would be minor, temporary adverse visual impacts associated with the prescribed burns, under the increased fire management program, with uncertain, though expected, long-term positive economic impacts to and within the local and regional economy.

There are several areas in which indirect economic effects may be seen within the local and regional economy. With any improvements to BLM lands in the planning area that would restore or enhance the landscape and its open space and scenic values, positive indirect socioeconomic effects would follow. Typical positive effects might include enhancement of quality of life factors for both residents and users, which have several follow-on effects within local and regional economies, such as expansion of the user base. Expansion of the user base would have certain indirect income effects in the local and regional economies. These indirect effects may be seen in continued demand for housing generating additional construction spending and employment associated with home construction, continued influx of retirees and additional spending in the region from transfer payments received from government and private retirement plans or investments, as well as continued movement into the region by the high tech and other light industries together with associated spending, and payments to communities in the region.

These alternatives all shift previously designated Zone 2 lands to Zone 1 lands. These alternatives would maintain large blocks of land with known resource values and would preserve a buffer between the rapidly growing communities of Redmond and Bend. Thus, indirect economic impacts of these alternatives should be comparable to those identified for Alternative 2. In addition, these alternatives would have a greater emphasis on maintaining lands for specific wildlife benefits. Given known local, regional and national preferences towards lands offering such opportunities, as in Alternative 2, efforts to maintain or enhance these attributes would have a positive quality of life impact on local resident users and non-local, non-resident users alike.

The greatest indirect economic impact is likely to be generated under Alternative 3 by the net decrease of nearly 2,500 community expansion acres being available for disposition compared to Alternative 1. These lands may also become ineligible for fairground or airport expansion. This would result in a loss of potential economic development opportunities for the region. The extent of deleterious economic development impacts would also depend on the availability of alternative sites and opportunities for meeting community expansion needs.

Local Roads

Alternative 2 would involve designing an integrated transportation system using existing local and historic roads (including existing county rights-of-way). This Alternative minimizes development of new rights-of-way on public lands. This alternative would have the highest density and most miles of collector roads of the action alternatives (the same as under Alternative 1, Table 4-27). The alternative includes an allocation of a transportation/utility corridor about one-half mile wide along the Burlington Northern-Santa Fe (BNSF) railroad right-of-way from south Redmond to Deschutes Junction. ODOT has indicated that it would not include an interchange at Quarry Road under this alternative. There would be no access from that corridor to the adjacent public lands. Under Alternative 2, some private lands could potentially be used for the future extension of the road to Deschutes Junction.

Alternatives 3- 7 would reduce the density and miles of collector roads and slightly increase the miles of local roads available for future designation or closure, leading to greater consolidation of the transportation system than under Alternatives 1 and 2.

The future local roadway configuration under this alternative is projected to be about 2800 miles. This would represent an increase of about 300 miles of local roads

Table 4-27. Road miles by alternative

	Road Miles by Alternative						
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Arterial	218	224	220	224	224	224	224
Collector	302	302	104	104	104	104	104
Local, available for closure	2,562	2,562	2,808	2,808	2,808	2,808	2,808
County Historical roads	199	190	191	182	182	182	182
Powell Butte – Paulina Cr. Rd. (vacated)	0	0	8	8	8	8	8
Horner Rd. (vacated)	0	9	0	9	9	9	9
Regional Utility Corridors	202	202	202	202	202	202	202
Rights-of-way	781	781	781	781	781	781	781

compared with Alternative 1, with a comparable decrease in collector roads. The decrease in collector roads would reduce the agency's future operating and maintenance responsibilities. The extent of this reduction would be partially offset by the increase in future operating and maintenance requirements associated with the increase in local roads. However, since the annual maintenance requirements and costs for local roads are far less than those for collector roads, it is expected that there would be a net reduction in the agency's maintenance costs. Based on an estimated annual operating and maintenance cost of \$2,200 for collector roads and \$950 for local roads, the future road maintenance costs under this Alternative would decrease by about \$210,000 compared to Alternatives 1 and 2. However, the current total annual road maintenance program budget for the Planning Area is only \$26,000. Given that BLM current road maintenance program has extensive deferred maintenance needs, while the reduction in agency's maintenance responsibilities would have a positive economic effect in reducing the agency's future road maintenance responsibilities, the effect may be estimated to be negligible since it is not expected to result in any savings in actual future road maintenance spending.

Cumulative Effects

Alternatives 2 and 4 have similar social and economic effects and significance even though some aspects of these alternatives differ. Alternative 2 generally continues a mix of uses on BLM lands and resolves use and resource conflicts on a case-by-case basis rather than by separating land uses. Alternative 4 emphasizes increasing recreation opportunities with more separation of uses.

The socioeconomic impacts associated with these alternatives are expected to be positive. Implementation of these alternatives is estimated to result in as much as \$0.182 million in increased spending and about five additional jobs in the region. Since a number of the impacts cannot be quantified, it is not possible to aggregate all impacts to determine the magnitude of the effects on the region's economy and social environment. The potential benefits of some of these unquantified impacts could be appreciable — especially the recreation-related effects.

The socioeconomic impacts identified under these alternatives are likely to be distributed over a wide variety of individuals and groups. Although the potentially greatest impacts may be expected to affect small specific user groups (e.g., recreational groups such as OHV users or target shooters), some of the more general impacts (e.g., amenity values and land ownership benefits) are expected to provide more broad, regional benefits to both resident and non-resident users. These alternatives are expected to provide a net beneficial socioeconomic impact on the region's economy and social environment. The benefits are expected to be relatively minor overall, and would be mostly dispersed (except for the recreational use impacts). A more specific and sizable socioeconomic benefit would derive from BLM's regional transportation contributions under Alternative 4.

There may be a wide variety of potential indirect socioeconomic impacts associated with the RMP alternatives, primarily associated with spending changes. Increases or decreases in spending within the region associated with the plan (e.g., from changes in agency program spending, user/visitor spending or resource use levels) would have indirect impacts from the related economic activity by dependant industries (e.g., local retail or service businesses).

In addition to the indirect economic impacts from spending, there may be socioeconomic impacts on the local users and communities from the RMP alternatives. As discussed in the resource specific analyses of impacts in Section 4, many of the direct impacts are not quantifiable, which means it is not possible to evaluate quantitatively the related indirect impacts. Aggregating non-quantifiable socioeconomic impacts can also be problematic, especially when the impacts affect a wide range of groups and individuals. The overall

net indirect socioeconomic impact of these alternatives has also been determined based on the limits of the available information.

All indirect socioeconomic impacts associated with these alternatives are expected to be beneficial. Implementation of these alternatives would result in about \$116,800 in increased indirect spending and about two jobs in the region.

Direct and indirect benefits for each alternative have been evaluated using comparative analysis to extrapolate trends based on secondary data from regional, state, and national sources. This analysis suggests that there will be net positive social and economic benefits generated in the communities and counties within the boundaries of the BLM managed lands relative to Alternative 2 and, to a great extent, Alternative 4. Positive indirect effects are likely to include enhanced quality of life factors for both residents and users and enhanced areas for passive recreation uses. These indirect effects also may be reflected in the continued influx of retirees, and additional spending in the region from transfer payments received from government and private retirement plans or investments, the influx of high tech and other light industry business and employees, and the related housing demand and construction jobs.

Alternatives 3, 5, 6, and 7 have similar social and economic effects and significance, even though aspects of these alternatives differ somewhat. Alternative 3 generally decreases human uses in the source habitats and special management areas and ACECs to resolve user and resource conflicts. Alternative 5 emphasizes segregated, low conflict activities in more urbanized parts of the Planning Area and promotes higher-conflict uses in more rural areas. Alternative 6, more than any other alternative, relies on local governments to create recreation opportunities. It emphasizes reducing conflicts between wildlife management and human activities in rural areas rather than in urban areas. Alternative 7 offers the greatest opportunity for using exchange lands to support the acquisition of other desirable lands, and generally emphasizes recreational uses that are managed for lower conflicts with wildlife in the areas away from population centers.

Nearly all of the socioeconomic impacts associated with Alternatives 3, 5, 6 and 7 would be beneficial. Implementation of these alternatives could result in as much as \$450,000 in increased spending and as many as 12 additional jobs in the region. In addition, there are substantial potential economic development benefits associated with the regional transportation system improvements facilitated by BLM's land resources under these alternatives. This economic development impact could potentially represent the greatest socioeconomic impacts associated with these alternatives.

Since a number of the impacts cannot be quantified, it is not possible to aggregate these impacts to determine the full magnitude of the ultimate effects on the region's economy and social environment. The potential magnitude of some of these unquantified impacts could be appreciable — especially the recreation-related effects.

In any case, the socioeconomic impacts identified under these alternatives would be distributed over a wide variety of individuals and groups. While the potentially greater impacts may be expected to affect small specific user groups (e.g., recreational groups such as OHV users or target shooters), some of the more general impacts (e.g., amenity values and land ownership benefits) may be expected to benefit most of the region's inhabitants and visitors.

These alternatives are expected to have a net beneficial socioeconomic impact on the region's economy and social environment. However, these benefits are expected to be relatively minor, except for the economic development impacts associated with BLM's regional transportation contributions and will be mostly dispersed (except for the recreational use impacts).

There may be a wide variety of potential indirect socioeconomic impacts associated with these RMP alternatives. The primary indirect impacts would be associated with spending changes associated with these RMP alternatives. Increases or decreases in spending within the region associated with the plan (e.g., from changes in agency program spending, user/visitor spending or resource use levels) will have indirect impacts from the related economic activity by dependent industries (e.g., home building, local retail, or service businesses).

Other potential indirect negative impacts could include artificially high local and regional land values resulting in a decrease of locally affordable housing opportunities, and the potential redistribution of particular sectors of the local communities. Similarly, these lands may also become ineligible for fairground or airport expansion, thus resulting in a loss of potential economic development opportunities for the region. The extent of deleterious economic development impacts will also depend on the availability of alternative sites and opportunities for meeting community expansion needs.

In addition to the indirect economic impacts from spending impacts, there may be socioeconomic impacts on the local users and communities from the RMP alternatives. As discussed in the resource-by-resource analyses of these impacts in Section 4, in most cases, the magnitude of these impacts can not be quantified since the existing causal relationships are generally complex and interdependent on other factors. Furthermore, since many of the direct impacts of the RMP alternatives are not quantifiable, it is not possible to evaluate quantitatively any related indirect impacts.

As discussed for the direct impacts, aggregating the alternative's non-quantifiable socioeconomic impacts can be problematic, particularly when the indirect impacts may affect a wide variety of groups and individuals. In any case, the main indirect impacts by resource topic associated with the alternative are presented below. The overall net indirect socioeconomic impact of the alternative also has been determined based on the limits of the available information.

Most of the indirect socioeconomic impacts associated with these alternatives are expected to be beneficial. Implementation of these alternatives is estimated to result in up to \$287,000 in increased indirect spending and 1 to 3.3 jobs in the region. In addition, there could be substantial indirect socioeconomic benefits to the region associated with future economic development facilitated by BLM assistance in resolving the Yew Avenue interchange transportation problems.

Alternative 1

This alternative continues the Brothers/La Pine Management Plan. Generally, Alternative 1 considered together with the other past, present and reasonably foreseeable federal, regional and local plans and projects described above would have no significant adverse cumulative impacts. Cumulatively, this alternative would contribute only slightly to variations in local economic activity, employment and income generated by BLM-managed resources. The primary causes of economic and social change in the area would be underlying national and regional economic trends. BLM management actions would minimally influence regional population growth.

Alternative 2

This alternative continues the general direction of the Brothers/La Pine Management Plan but changes emphasis or helps clarify management objectives in that plan. This alternative retains 89 percent of the Planning Area as Zone 1 lands, preserving the areas undeveloped and natural character, and preserving the greenbelt buffer between rapidly growing urban areas in Bend and Redmond. This alternative increases and improves recreational opportunities in the Planning Area and offers potential development of recreational amenities for local communities. Generally, Alternative 2 considered together with the other past, present and reasonably foreseeable federal, regional and local plans

and projects described above would have no adverse cumulative impacts. Cumulatively, this alternative would contribute only slightly to variations in local economic activity, employment and income generated by BLM-managed resources. The primary causes of economic and social change in the area would be underlying national and regional economic trends. BLM management actions would minimally influence regional population growth. However, Alternative 2 would likely have a beneficial cumulative social impact when considered in conjunction with other plans and projects in the area, since the project increases and improves recreational opportunities, one of the region's priorities given its fast-paced development.

Alternative 3

Alternative 3 places greater limitations on human activities in source habitats and areas having hydrologic or other ecosystem problems. It would involve managing 20 percent of the Planning Area exclusively for non-motorized uses. This alternative also retains 89 percent of the Planning Area as Zone 1 lands, preserving the areas undeveloped and natural character, and preserving the greenbelt buffer between rapidly growing urban areas in Bend and Redmond. Similar to Alternative 2, therefore, Alternative 3 considered together with the other past, present and reasonably foreseeable federal, regional and local plans and projects described above would have no adverse cumulative impacts. Cumulatively, this alternative would contribute only slightly to variations in local economic activity, employment and income generated by BLM-managed resources. The primary causes of economic and social change in the area would be underlying national and regional economic trends. BLM management actions would minimally influence regional population growth. However, as with Alternative 2, Alternative 3 could also offer some beneficial cumulative social impacts by retaining a high percentage of land for recreation.

Alternative 4

Alternative 4 emphasizes improving or increasing the spectrum of recreational opportunities in the Planning Area and separating uses. This alternative would involve managing 30 percent of the Planning Area with an emphasis on non-motorized uses. Further, this alternative offers the opportunity to use land exchanges to acquire other desirable lands in the Planning Area. This alternative also emphasizes wildlife travel and connectivity corridors. Similar to previous alternatives therefore, Alternative 4 considered together with the other past, present and reasonably foreseeable federal, regional and local plans and projects described above would have no adverse cumulative impacts. Cumulatively, this alternative would contribute only slightly to variations in local economic activity, employment and income generated by BLM-managed resources. The primary causes of economic and social change in the area would be underlying national and regional economic trends. BLM management actions would minimally influence regional population growth. Similar to previous alternatives, however, Alternative 4 could also offer some beneficial cumulative social impacts by emphasizing not only recreational opportunities but also wildlife and ecosystem needs. Because of the region's rapid development and shortage of land for a variety of uses, the cumulative social benefits associated with an alternative that considers the needs of users, wildlife and the ecosystem could be substantial when considering social values of the region.

Alternative 5

Alternative 5 emphasizes segregated, low conflict activities in more urbanized parts of the Planning Area and promotes higher-conflict uses in more rural areas. This alternative seeks to reduce conflicts between users and residents in urbanized areas around Bend and Redmond. Similar to previous alternatives, therefore, Alternative 5 considered together with the other past, present and reasonably foreseeable federal, regional and local plans and projects described above would have no adverse cumulative impacts. Cumulatively, this alternative would contribute only slightly to variations in local economic activity, employment and income generated by BLM-managed resources. The primary causes of economic and social change in the area would be underlying national

and regional economic trends. BLM management actions would minimally influence regional population growth. Similar to previous alternatives, however, Alternative 5 could also offer some beneficial cumulative social impacts by emphasizing conflict reduction in more urban parts of the Planning Area. In particular, when considered together with the type of planning goals outlined in the Redmond 2020 Comprehensive Plan (City of Redmond, 2001) and the Bend Area General Plan (City of Bend, 1998), this alternative would offer cumulative beneficial social impacts to those urban communities.

Alternative 6

Alternative 6, more than any other alternative, relies on local governments to create recreation opportunities in urban core areas. This alternative, in contrast to Alternative 5, emphasizes reducing conflicts between wildlife management and human activities in rural areas rather than in urban areas. Alternative 6 considered together with the other past, present and reasonably foreseeable federal, regional and local plans and projects described above could have some slightly adverse cumulative impacts because of its reliance on local governments to develop urban recreational opportunities. Generally, however, this alternative would contribute only slightly to variations in local economic activity, employment and income generated by BLM-managed resources. The primary causes of economic and social change in the area would be underlying national and regional economic trends. BLM management actions would minimally influence regional population growth.

Alternative 7

Alternative 7 offers the greatest opportunity for using exchange lands to support the acquisition of other desirable lands within the Planning Area. Also, Alternative 7 generally emphasizes recreational use that is managed for lower conflicts with wildlife in the areas away from population centers. Similar to previous alternatives, therefore, Alternative 7 considered together with the other past, present and reasonably foreseeable federal, regional and local plans and projects described above would have no adverse cumulative impacts. Cumulatively, this alternative would contribute only slightly to variations in local economic activity, employment and income generated by BLM-managed resources. The primary causes of economic and social change in the area would be underlying national and regional economic trends. BLM management actions would minimally influence regional population growth. Similar to previous alternatives, however, Alternative 7 could also offer some beneficial cumulative social impacts by emphasizing greater exchange land possibilities and reducing potential wildlife conflicts near population centers.

Environmental Justice

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994) requires that all federal agencies “make achieving Environmental Justice part of [their] mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

As indicated in Table 3-1, Population Profile 2000 Race/Ethnicity Distribution (Chapter 3), neither of the counties covered by the planning area has minority populations above the rate for the state of Oregon. The 2000 Census findings show that neither Crook nor Deschutes counties have poverty rates above the rate for the state of Oregon. See Table 4-28, below.

No ethnic groups or low income populations have been identified as being disproportionately adversely impacted under the No Action or Action Alternatives considered for the planning area.

Table 4-28. Percentage of Population below Poverty Level for All People in Poverty for Oregon, Crook County, and Deschutes County According to 2000 Census.

All people in poverty - 1999	
Area	Percent
Oregon	11.6
Crook	11.3
Deschutes	9.3

Source: <http://www.ers.usda.gov/data/povertyrates/PovListpct.asp?st=OR&view=Percent>

